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OF FISH AND FISHERIES FOR 1884.]

A CATALOGUE

OF THE

FISHES KNOWN TO INHABIT THE WATERS OF NORTH AMERICA,

NORTH OF THE TROPIC OF CANCER,

WITH

NOTES ON THE SPECIES DISCOVERED IN 1883 AND 1884.

BY

DAVID STARR JORDAN.

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The Synopsis of the Fishes of North America, by David S. Jordan and Charles H. Gilbert (Bulletin United States National Museum No. 16), was finished in September, 1882, and was issued to the public about April 1, 1883.

Since the publication of that work an active study of North American fishes has brought to light many species not included in the Synopsis, and has shown various errors in the nomenclature of species already known. The additions are chiefly in the Bassalian or deep-sea fauna of the Atlantic, in the tropical fauna of the Florida Keys, and in the fresh-water fauna of the lower part of the Mississippi Valley.

It was at first determined to issue these addenda in the form of annual supplements to the Synopsis, but the publication of the supplement for 1883 having been delayed till January, 1885, it has been thought best to unite the lists for 1883 and 1884, and to put the matter in the present form.

I have, therefore, given a list representing the present state of our knowledge of the fishes found north of the Tropic of Cancer, in American waters. In all cases where a species is included which is not in the Synopsis, or in which a name is used in the latter work, different from that here adopted, I have given an explanation, reference or description in the form of a foot-note. Species already fully described elsewhere in publications of the U. S. National Museum are not redescribed here.

In matters of nomenclature and classification I have followed, in this list, the arrangement in the Synopsis, unless important reasons for deviation have appeared. In such cases I have endeavored to avoid premature changes, and the substitution of one doubtful opinion for another.

In this list the families, genera, and species are numbered consecutively from the first. These numbers necessarily differ from those in the Synopsis. The numbers used in that work are here placed in parentheses after the names.

I have also indicated in a general way the geographical distribution of each species by the following signs:

- B.—Bassalian or deep-sea fauna of the Atlantic.
- BC.—Bassalian fauna of the Pacific.
- G.—Arctic (Greenland) fauna.
- N.—Shore fauna of North Atlantic States.
- S.—Shore fauna of South Atlantic and Gulf States.
- W.—West Indian fauna (including Florida Keys).
- P.—Tropical fauna of the Pacific coast (Gulf of California to Ecuador).
- C.—California shore fauna (Cape Flattery to Cerros Island, &c.).
- A.—Alaskan shore fauna.
- Y.—Alaskan fresh-water fauna (Yukon).
- T.—Fresh-water fauna of region west of Sierra Nevada and Cascade Range (Transmontane).
- R.—Fauna of region between Rocky Mountains and Sierra Nevada.
- V.—Fresh-water fauna of region east of Rocky Mountains (again subdivided into Vn, the northern part of this range; Vs, the southern; Vsw, the southwestern, &c.).
- E.—Europe.
- O.—Pelagic species.
- Ana.—Anadromous species.
- Acc. Accidental visitants.

In this paper I have adopted as the southern boundary of temperate North America the Tropic of Cancer, or a line connecting Key West with Brazos Santiago and Cape San Lucas, instead of the conventional Mexican boundary.

INDIANA UNIVERSITY,  
*January 1, 1885.*

# CATALOGUE OF THE FISHES OF NORTH AMERICA.

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## CLASS I.—LEPTOCARDII. (I)

### ORDER A.—CIRROSTOMI. (A)

#### Family I.—BRANCHIOSTOMIDÆ. (1)

##### 1.—**BRANCHIOSTOMA** Costa. (1)

1. **Branchiostoma lanceolatum** Pallas. E. S. C. P. (1)

## CLASS II.—MARSIPOBRANCHII. (II)

### ORDER B.—HYPEROTRETA. (B)

#### Family II.—MYXINIDÆ. (2)

##### 2.—**MYXINE** Linnæus. (2)

2. **Myxine glutinosa** Linnæus. B. En. (2)

#### Family III.—BDELOSTOMIDÆ.

##### 3.—**POLISTOTREMA** Gill. (3)

3. **Polistotrema dombeyi** Müller. C. (3)

### ORDER C.—HYPEROTRETA. (C)

#### Family IV.—PETROMYZONTIDÆ. (3)

##### 4.—**AMMOCETES** Duméril.<sup>1</sup> (3b.) (4, 5)

##### § *Entosphenus* Gill. (3b.) (4, 5, 6)

4. **Ammocetes tridentatus** Gairdner. C. Ana. (4)

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<sup>1</sup> For discussions of the genera of *Petromyzontidæ* see Gill (Proc. U. S. Nat. Mus., 1882, 552) and Jordan & Gilbert (*ibid.*, 1883, 208). Our species fall most naturally into two groups, which we may call genera, *Ammocetes* with the discal and peripheral teeth differentiated, and the supraoral lamina (maxillary tooth) crescentiform, and *Petromyzon* having the discal and peripheral teeth in obliquely decurved continuous rows, and the supraoral lamina contracted, with 2 or 3 converging teeth. In both groups are minor modifications, indicative of subgenera, the marine species of each (*marinus*, *tridentatus*) being stronger, with more specialized dentition than the small fluvial forms.

§ *Lampetra* Gray. (3pt.)

- 5. Ammocetes cibarius**<sup>1</sup> Girard. C. Ana. (7)  
**6. Ammocetes aureus** Bean. A. Ana. (7b)

§ *Ammocetes*. .

- 7. Ammocetes æpypterus**<sup>2</sup> Abbott. Vn. (8)

**5.—PETROMYZON (Artedi) Linnaeus. (7)**§ *Ichthyomyzon* Girard. (6)

- 8. Petromyzon bdelium**<sup>3</sup> Jordan. Vn. (9)

- 9. Petromyzon hirudo** Girard. Vn. (9b.)

- 10. Petromyzon castaneus** Girard. Vw. (10)

§ *Petromyzon*. (7)

- 11. Petromyzon marinus** L. N. Eu. Ana. (11)

- 11b Petromyzon marinus dorsatus** Wilder. Ve. (12)

**6.—BATHYMYZON<sup>4</sup> Gill.**

- 12. Bathymyzon bairdii**<sup>5</sup> Gill. B.

**CLASS III.—PISCES.****Subclass ELASMOBRANCHII.****ORDER D.—OPISTHARTHRI.<sup>6</sup>****Family V.—NOTIDANIDÆ. (15)****7.—HEPTRANCHIAS** Rafinesque. (32)§ *Notorhynchus* Ayres.

- 13. Heptranchias maculatus** Ayres. C. (42)

**8.—HEXANCHUS** Rafinesque. (31b.)

- 14. Hexanchus corinus** Jordan & Gilbert. C. (42b.)

<sup>1</sup> The name *Petromyzon plumbeus* is preoccupied by Shaw, 1805.

<sup>2</sup> The name *Petromyzon niger* is preoccupied by Lacépède, 1798. This is probably the species poorly described by Abbott as *Amm. æpyptera*.

<sup>3</sup> The name *Petromyzon argenteus* is preoccupied by Bloch, 1790. I propose the new name *P. bdelium* for this species, as I cannot identify it certainly with *Ammocetes concolor* Kirtland, *A. borealis* Ag., or any other nominal species, based on larval forms.

<sup>4</sup> BATHYMYZON Gill, Proc. U. S. Nat. Mus., 1883, 254; type *Petromyzon* (*Bathymyzon*) *bairdii* Gill. (βαθυς—deep; μύζω—to suck.) This genus is said to differ from *Petromyzon* in having “the supraloral and infroral plates or laminae destitute of odontoid tubercles, the armature of the lamprey type being obsolescent.”

<sup>5</sup> *Petromyzon* (*Bathymyzon*) *bairdii* Gill., l. c. 254, Gulf Stream, latitude 40°, at a depth of 547 fathoms. The species has not been described, except that it is “closely related to *Petromyzon marinus*.”

<sup>6</sup> The groups called *Opiistharthri* and *Proarthri*, certainly worthy of ordinal distinction from the other Sharks, are defined by Professor Gill in our Synopsis Fish. N. A., 967.

## ORDER E.—PROARTHRI.

## Family VI.—CESTRACIIDÆ. (14)

9.—CESTRACION<sup>1</sup> Cuvier. (31)§ *Gyropleurodon* Gill.15. **Cestracion francisci** Girard. C. (41)

## ORDER F.—SQUALI.

## Family VII.—SCYMNIDÆ. (4)

10.—ECHINORHINUS Blainville. (8)

16. **Echinorhinus spinosus** Gmelin. Acc. Eu. (13)

11.—SOMNIOSUS Le Sueur. (9)

17. **Somniosus microcephalus** Bloch. A. G. Eu. (14)

## Family VIII.—SPINACIDÆ. (5)

12.—CENTROSCYLLIUM Müller &amp; Henle. (10)

18. **Centroscyllium fabricii** Reinhardt. G. (15)

13.—SQUALUS (Artedi) Linnæus. (11)

19. **Squalus acanthias** Linnæus. C. A. G. N. Eu. (16)

14.—CENTROSCYMNUS Bocage &amp; Capello. (12)

20. **Centroscymnus cœlolepis** Bocage & Capello. B. Eu. (17)

## Family IX.—SCYLLIIDÆ. (6)

15.—SCYLLIORHINUS Blainville. (13b.)

§ *Catulus* Smith. (13b.)21. **Scylliorhinus ventriosus** Garman. C. (18b.)22. **Scylliorhinus retifer** Garman. B. (18c.)

<sup>1</sup> CESTRACION Cuvier (*Règne Animal*, type *Cestracion philippi* Bloch and Schneider) should perhaps be adopted instead of *Heterodontus* Blainville, preoccupied in Herpetology as *Heterodon*. Both words are from ἑτερός, ὁδών (οὐδούς), and are correctly written *Heterodus* or *Heterodon*, not *Heterodontus*. *Cestracion* is an old name of the Hammerheaded shark, from κέστρων, a pick-axe, or similar instrument.

16.—**PSEUDOTRIACIS**<sup>1</sup> Capello.23. **Pseudotriacis microdon**<sup>2</sup> Capello. P. Eu.17.—**GINGLYMOSTOMA** Müller & Henle. (13)24. **Ginglymostoma cirratum** Gmelin. W. P. (18)Family X.—**GALEORHINIDÆ.** (7)18.—**GALEUS**<sup>3</sup> (Rafinesque) Leach. (14)*§ Galeus.*25. **Galeus lunulatus**<sup>4</sup> Jordan & Gilbert. P.

<sup>1</sup> **PSEUDOTRIACIS** Capello. (*Pseudotriakis* Capello, Jorn. Sci. Math. Phys. e Nat. Lisboa, 1868, 321; type *Pseudotriakis microdon* Capello.)

Body elongate; mouth wide, with a very short labial fold near the angle; snout depressed; nostrils inferior, not confluent with the mouth; eyes oblong, lateral, without nictitating membrane; spiracles well developed behind the eye; gill openings moderate, in advance of pectoral; jaws with many rows of very small, tricuspid teeth; first dorsal fin long and low, highest posteriorly, inserted opposite the space between pectorals and ventrals; second dorsal rather large, larger than anal; ventrals and pectorals well developed; no pit at root of caudal; caudal fin divided by a notch into a short upper portion and a very low and long lower portion. Skin with minute asperities. One species known ( $\Psi\epsilon\tilde{\nu}\delta\sigma$ , false;  $\tau\rho\epsilon\tau\alpha\kappa\iota\varsigma$ , triacis).

<sup>2</sup> *Pseudotriacis microdon* Capello, Jorn. Sci. Math. &c., Lisboa, 1868, 321; Gunther, VIII, 395; Bean, Proc. U. S. Nat. Mus., VI, 1883, 147. Two specimens of this species are known, the type from Portugal, the second, 10 feet in length, lately taken at Amagansett, on Long Island. (Bean.)

<sup>3</sup> **GALEUS** Rafinesque. (*Mus elus* Cuvier.)

(Rafinesque, Caratteri di alcuni nuovi Generi, 1810, 13: *vulpeculus*, *melastomus*, *catulus* and *mustelus*: *Galeus* Leach, Observ. Genus *Squalus* of Linné: 1812, 62, type *Squalus mustelus* Leach = *Sq. canis* Mitchell.)

The name *Galeus* was first used in binomial nomenclature by Rafinesque, for a genus thus defined:

“VIII. G. **GALEUS**.—Due spiragli, due ale dorsali, un ala anale, cinque branchie da ogni lato; coda disegnata, obliqua.

“Osservazione. La maggior parte degli autori si annoverano in questo genere, il quale si distingue dal vero genere *Squalus* della presenza di un ala anale.”

Four species are mentioned, *vulpeculus*: *melastomus*: *catulus* and *mustelus*. Although the species which the author had in mind was probably *Squalus galeus* L., it is improper to assume this species as the type, as no mention is made of it by the author in question.

In 1812, Leach proposed a genus *Galeus*, to include sharks with the anal fin present and the caudal fin irregular (*i. e.*, not lunate). But one species, *Galeus mustelus*, is mentioned by Leach. Still later, a subgenus, *Galeorhinus*, was proposed by Blainville for sharks distinguished from *Carcharhinus* Blainv. (= *Carcharias* Cuvier), by the presence of spiracles. In this group are included with others, *Squalus mustelus* and *Squalus galeus* of Linnæus. Still later (1817), the genera *Mustelus*, *Carcharias*, and *Galeus* were defined by Cuvier, and with his definition have been accepted by nearly all later authors.

The rules of nomenclature seem to me to require the retention of the genus *Galeus* Rafinesque, for the group for which the same name was used by Leach, *i. e.*, instead of *Mustelus* Cuvier.

<sup>4</sup> *Mustelus lunulatus* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 108; Mazatlan, Mexico.

In this paper is given an analysis of the distinctive characters of the four North American species of *Galeus*:—*lunulatus*, *canis*, *dorsalis*, and *californicus*.

26. **Galeus canis** Mitchell. N. Eu. (19)

§ *Pleuracromylon* Gill.

27. **Galeus californicus** Gill. C.

19.—**TRIACIS** Müller & Henle. (15)

§ *Triacis*.

28. **Triacis semifasciatus** Girard. C. (21)

§ *Rhinotriacis* Gill.

29. **Triacis henlei** Gill. C. (22)

20.—**GALEORHINUS** Blainville. (16)

30. **Galeorhinus zyopterus** Jordan & Gilbert. C. (23)

21.—**GALEOCERDO** Müller & Henle. (17)

31. **Galeocerdo maculatus**<sup>1</sup> Ranzani. W. P. (24)

22.—**CARCHARHINUS**<sup>2</sup> Blainville. (18, 19, 20, 21)

§ *Carcharinus*.

32. **Carcharhinus glaucus** Linnaeus. C. O. Eu. (25)

§ *Eulamia* Gill.

33. **Carcharhinus obscurus** Le Sueur. N. (26)

34. **Carcharhinus æthalorus**<sup>3</sup> Jordan & Gilbert. P.

35. **Carcharhinus fronto**<sup>4</sup> Jordan & Gilbert. P.

36. **Carcharhinus platyodon** Poey. W. S. (26b.)

<sup>1</sup> *Galeus maculatus* Ranzani, De Novis Speciebus Piscium, Dissert. Prima, 1838, 7; *Galeocerdo maculatus*, Poey, Enumeratio Pisc. Cubens., 201, 1875. This name has priority over *G. tigrinus* Müller & Henle.

<sup>2</sup> Although *Carcharias glaucus* was probably the species in mind when Rafinesque proposed his genus *Carcharias*, he makes no reference to this species. The only species actually mentioned by him in connection with the original account of his genus *Carcharias* is *Odontaspis taurus*. The name *Carcharias*, if used at all, should supersede *Odontaspis*. This is the view at first taken by us in the Synopsis Fish. N. A., but afterwards, in the Addendum, p. 872, changed to follow current usage.

The oldest tenable name of this group is that of *Carcharhinus* Blainville. I think it best to regard *Eulamia*, *Aprionodon*, *Hypopriion*, and *Scoliodon* as subgenera under *Carcharhinus*, rather than as distinct genera.

<sup>3</sup> *Carcharias æthalorus* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 104; Mazatlan: Panama.

<sup>4</sup> *Carcharias fronto* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 102. Mazatlan.

37. *Carcharhinus caudatus*<sup>1</sup> De Kay. N. (27)  
 38. *Carcharhinus lamia*<sup>2</sup> Risso. W. Eu.  
 39. *Carcharhinus lamiella* Jordan & Gilbert. C. (27b.)

§ *Hypopriion* Müller & Henle. (19b)

40. *Carcharhinus brevirostris*<sup>3</sup> Poey. W. (28b.)

§ *Isogomphodon* Gill. (19)

41. *Carcharhinus limbatus* Müller & Henle. W. Acc. (28)

§ *Aprionodon* Gill.

42. *Carcharhinus isodon*<sup>4</sup> Müller & Henle. W. Acc. (29)

§ *Scoliodon* Müller & Henle. (21)

43. *Carcharhinus longurio*<sup>5</sup> Jordan & Gilbert. P.

44. *Carcharhinus terræ-novæ*<sup>6</sup> Richardson. N. S. W. (30)

### Family XI.—SPHYRNIDÆ. (8)

#### 23.—SPHYRNA Rafinesque. (22, 23)

§ *Reniceps* Gill. (22)

45. *Sphyra tiburo* Gill. S. W. (31)

<sup>1</sup> The name *caruleus* is preoccupied in this genus by the *Squalus (Carcharinus) caruleus* of Blainville, 1816, a synonym of *Carcharhinus glaucus*. The name next in date is that of *Lamna caudata* De Kay, New York Fauna, Fishes, 1842, 354.

<sup>2</sup> *Carcharhinus lamia*. This species is described on page 873, in the Synopsis. It is abundant in the Mediterranean and in the West Indies, ranging northward to the Florida Keys, being common about the wharves at Key West. Base of first dorsal  $1\frac{1}{2}$  in interspace between dorsals; base of second,  $4\frac{3}{4}$ ; length of pectoral, about 5 in length of body.

(*Carcharias lamia* Rafinesque, Indice, 1810, 44; name only; *Squalus carcharias* (in part?) Cuvier (*Règne Animal*), and of several authors; not of Linnaeus; *Carcharias lamia* Risso, Hist. Nat. Europ. Mérid., III, 119, 1826; *Squalus longimanus* Poey, Memorias Cuba, II, 338; *Eulamia longimana* Poey, Syn. Pisc. Cubens., 1868, 448; *Eulamia lamia* Poey, Enum. Pisc. Cubens., 188; *Carcharias lamia* Jordan, Proc. U. S. Nat. Mus., 1884, 104 (Key West.).)

<sup>3</sup> *Carcharhinus brevirostris* is described in detail by Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 581, and by Jordan *op. cit.*, 1884, 104, from specimens obtained at Charleston and Key West.

<sup>4</sup> *Carcharhinus isodon*, briefly described in the Synopsis (p. 24) as *Aprionodon punctatus*, is a West Indian species, very lately obtained for the first time on our coast. (Parker.)

<sup>5</sup> *Carcharias longurio* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1852, 106; Mazatlan.

<sup>6</sup> Specimens of *Scoliodon terra-novæ*, *Malthe radiata* (*cubifrons*), *Scorpana plumieri* (*bufo*), and other fishes of the warm seas, were given by Audubon to Richardson, and by Richardson described as coming from the waters about Newfoundland. There can be little doubt that these specimens really came from Southern Florida, in which region Audubon made extensive collections. The *Squalus punctatus* of Mitchell has been identified by me with *C. terra-novæ*, and by Prof. Gill with *C. isodon*. The name *punctatus* is in any case preoccupied and cannot be used for either species. *Squalus punctatus* Bloch & Schneider 1801, is a *Ginglymostoma*.

§ *Sphyra*.

46. *Sphyra tudes*<sup>1</sup> Cuvier. W. P. Eu.  
 47. *Sphyra zygæna* Linnaeus. N. S. W. C. P. (32)

## Family XII.—ALOPIIDÆ. (9)

24.—**ALOPIAS** Rafinesque. (24)

48. *Alopias vulpes* Gmelin. C. N. Eu. (33)

## Family XIII.—ODONTASPIDIDÆ. (10).

25.—**CARCHARIAS**<sup>2</sup> Rafinesque. (25)§ *Eugomphodus* Gill.

49. *Carcharias littoralis* Mitchell. N. (34)

## Family XIV.—LAMNIDÆ. (11)

26.—**ISURUS** Rafinesque. (26)§ *Isuropsis* Gill.

50. *Isurus dekayi* Gill. W. S. (35; 36)

27.—**LAMNA** Cuvier. (27)

51. *Lamna cornubica* Gmelin. C. Eu. N. (37)

28.—**CARCHARODON** Smith. (28)

52. *Carcharodon carcharias*<sup>3</sup> Linnaeus. C. N. Eu. O. (38)

## Family XV.—CETORHINIDÆ. (12)

29.—**CETORHINUS** Blainville. (29)

53. *Cetorhinus maximus* Gunner. C. N. Eu. O. (39)

<sup>1</sup> *Sphyra tudes* Cuvier. Intermediate in all respects between *S. zygæna* and *S. tiburo*, the hammer longer and less produced laterally than in the former. Anterior margin of the head much curved, but not continuous with the lateral edge; length of hinder margin of one side of the hammer less than its width near the eye. Nostril close to the eye, its groove longer than in *S. tiburo*, but very short, continued for but a short distance along the side of the head, and followed by a line of pores.

A large shark, of the warm seas, Gulf of California, West Indies, Mediterranean, and Indian Ocean.

(*Zygæna tudes* Cuvier (*Règne Animal*); *Sphyra tudes* Müller & Henle, *Plagiost.*, 53; *Zygæna tudes* Günther, VIII, 382; *Sphyra tudes* Jordan & Gilbert, *Bull. U. S. Fish Comm.*, 1882, 105.)

<sup>2</sup> *Carcharias* Rafinesque was established for those sharks, "the most enormous and most voracious of their order, which differ from the genus *Galeus* Rafinesque, by the lack of spiracles." But one species (*Carcharias taurus* Rafinesque) is mentioned, and this species, although really possessing spiracles, must be regarded as the type of *Carcharias*. This name should therefore supersede *Odontaspis*.

<sup>3</sup> A good account of this species is given by Dr. W. B. Stevenson, *Proc. Vassar Brothers Sci. Soc.*, Poughkeepsie, 1884, and in *American Naturalist* for the same year.

## Family XVI.—RHINODONTIDÆ. (13)

30.—**MICRISTODUS** Gill. (30)54. **Micristodus punctatus** Gill. P. (40)

## Family XVII.—SQUATINIDÆ. (16)

31.—**SQUATINA** Duméril. (33)55. **Squatina squatina**<sup>1</sup> Linnaeus. C. N. Eu. (43)

## ORDER G.—RAIÆ. (E)

## Family XVIII.—PRISTIDIDÆ. (17)

32.—**PRISTIS**. Latham. (34)56. **Pristis pectinatus** Latham. W. S. (44)57. **Pristis perrottetii**<sup>2</sup> Müller & Henle. P.

## Family XIX.—RHINOBATIDÆ. (18)

33.—**RHINOBATUS** Bloch & Schneider. (35)§ *Rhinobatus*.58. **Rhinobatus productus** Ayres. C. (45)59. **Rhinobatus glaucostigma**<sup>3</sup> Jordan & Gilbert. P.60. **Rhinobatus lengtiginosus** Garman. W. (45d)§ *Zapteryx*. Jordan & Gilbert.61. **Rhinobatus exasperatus** Jordan & Gilbert. C. P. (45b)§ *Platyrhinoidis*. Garman.62. **Rhinobatus triseriatus** Jordan & Gilbert. C. (45c)

<sup>1</sup> Our reasons for retaining the original specific name, even when identical with the name of the genus, have been given in full in Proc. U. S. Nat. Mus., 1884, 18. The same view of the case has been adopted by the American Ornithologists' Union.

<sup>2</sup> *Pristis perrotteti* Müller & Henle. Rostral teeth in 18 or 20 pairs, not trenchant behind; distant from one another, the base of each tooth being about one-third the interspaces. Dorsal fin nearly in advance of ventrals. Root of pectoral in advance of first gill-opening, its outer angle a right one. Second dorsal not much smaller than first; a smaller lower caudal lobe. (Günther.) Tropical seas, north to Mazatlan, on the Pacific coast.

(Müller & Henle, 108; Günther, VIII, 436; Jordan & Gilbert, Bull. U. S. Nat. Mus., 1882, 105.)

<sup>3</sup> *Rhinobatus glaucostigma* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1883, 210. Mazatlan; Gulf of California.

## Family XX.—RAIIDÆ. (20)

## 34.—RAIA Linnæus. (37)

63. *Raia erinacea* Mitchell. N. (48)  
 64. *Raia ocellata* Mitchell. N. (49)  
 65. *Raia radiata* Donovan. N. Eu. (50)  
 66. *Raia eglanteria* Lacépède. N. (51)  
 67. *Raia ackleyi ornata* Garman. W. B. (53c.)  
 68. *Raia plutonia* Garman. W. B. (53c.)  
 69. *Raia granulata* Gill. B. (53)  
 70. *Raia parvifera* Beau. A. (57b.)  
 71. *Raia stellulata* Jordan & Gilbert. C. (57)  
 72. *Raia inornata* Jordan & Gilbert. C. (56)  
 72b *Raia inornata inermis* Jordan & Gilbert. C.  
 73. *Raia rhina* Jordan & Gilbert. C. A. (55)  
 74. *Raia binoculata* Cooper. C. A. (54)  
 75. *Raia laevis* Mitchell. N. (52)

## Family XXI.—TORPEDINIDÆ. (19)

## 35.—TORPEDO Duméril. (36)

76. *Torpedo occidentalis* Storer. E. (46)  
 77. *Torpedo californica* Ayres. W. (47)

## 36.—NARCINE Müller &amp; Henle. (36b.)

78. *Narcine brasiliensis* Olfers. W. (47b.)  
 78b *Narcine brasiliensis corallina* Garman. W.  
 79. *Narcine umbrosa*<sup>1</sup> Jordan. W.

## Family XXII.—TRYGONIDÆ. (21)

## 37.—UROLOPHUS Müller &amp; Henle. (38)

80. *Urolophus halleri* Cooper. C. P. (58)  
 81. *Urolophus asterias*<sup>2</sup> Jordan & Gilbert. P.

## 38.—PTEROPLATEA Müller &amp; Henle. (39)

82. *Pteroplatea crebripunctata*<sup>3</sup> Peters. P.  
 83. *Pteroplatea maclura* Le Sueur. S. (59)  
 84. *Pteroplatea marmorata* Cooper. C. (60)

<sup>1</sup>*Narcine umbrosa* Jordan, Proc. U. S. Nat. Mus., 1884, 105; Key West.

<sup>2</sup>*Urolophus asterias* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 579; Mazatlan, Panama.

<sup>3</sup>*Pteroplatea crebripunctata* Peters, Monatsber, Berl. Akad, 1869, 703. This species is very common in the Gulf of California. It is thus described by Dr. Peters:

Breadth of disk twice the distance from tip of snout to vent. Snout with a blunt projection; anterior margin of pectorals undulate, convex anteriorly and posteriorly, medially weakly concave; outer angle sharply rounded; posterior margins weakly convex, the posterior angle rounded, covering outer half of base of ventrals; spiracle without tentacle; tail (mutilated) with a low fold on its upper edge. Brown above, with thick-set black points; a row of small, close-set yellow spots on front of disk; under side yellowish.

I have compared specimens of this species with *P. maclura* and *P. marmorata*, and regard the three as unquestionably distinct, although closely related.

## 39.—TRYGON Adanson. (40)

85. *Trygon centura* Mitchell. N. (61)  
 86. *Trygon hastata* De Kay. S. (62b)  
 87. *Trygon sayi* Le Sueur. S. W. (62)  
 88. *Trygon longa*<sup>1</sup> Garman. P.  
 89. *Trygon dipterura* Jordan & Gilbert. C. (63)  
 90. *Trygon tuberculata* Lacépède. W. (64)  
 91. *Trygon sabina* Le Sueur. S. (65)

## Family XXIII.—MYLIOBATIDÆ. (22.)

## 40.—STOASODON Cantor. (41)

92. *Stoasodon narinari* Euphrasen. S. W. (66)  
 93. *Stoasodon laticeps*<sup>2</sup> Gill. P.

## 41.—MYLIOBATIS Duméril. (42)

94. *Myliobatis freminvillei* Le Sueur. E. S. (67)  
 95. *Myliobatis californicus* Gill. C. (68)

## 42.—RHINOPTERA Kuhl. (43)

96. *Rhinoptera quadriloba* Le Sueur. N. (69)

## Family XXIV.—CEPHALOPTERIDÆ. (23.)

## 43.—MANTA Bancroft. (44)

97. *Manta birostris* Walbaum. S. P. W. (70)

## Subclass HOLOCEPHALI.

## ORDER H.—HOLOCEPHALI. (F)

## Family XXV.—CHIMÆRIDÆ. (24)

## 44.—CHIMÆRA Linnaeus. (45)

§ *Chimara*.

98. *Chimæra affinis* Capello,<sup>3</sup> B. Eu. (71)

§ *Hydrolagus* Gill.

99. *Chimæra colliei* Bennett. C. A. (72)

<sup>1</sup> *Trygon longa* Garman. This species is described in the Synopsis Fish N. A., p. 66. It is not uncommon along the Pacific coast, from the Gulf of California to Panama.

<sup>2</sup> *Aëtobatis laticeps* Gill, Ann. Lyc. Nat. Hist. N. Y., 1865, 137. This species is abundant from the Gulf of California southward. It has never been properly compared with *S. narinari*, and may not be different.

<sup>3</sup> *Chimæra plumbea* and *abbreviata* Gill.

To the synonymy in the Synopsis (. 54) add: *Chimæra affinis* Capello, Jorn. Sci. Math. Phys. e. Nat., Lisboa, IV, 1868, 314, pl. III (facing p. 274), ff. 1, 1a.; Günther, VIII, 350; *Chimæra abbreviata* Gill, Proc. U. S. Nat. Mus., 1883, VI, 254.)

We are indebted to Dr. Bean for the information that the *Chimæra plumbea* and *Chimæra abbreviata* of Dr. Gill are identical with each other and with *Ch. affinis*.

## Subclass ACTINOPTERI.

## ORDER I.—SELACHOSTOMI. (G)

## Family XXVI.—POLYODONTIDÆ. (25)

45.—**POLYODON** Lacépède. (46)**100. Polyodon spathula** Walbaum. Vw. (73)

## ORDER J.—GLANIOSTOMI. (H)

## Family XXVII.—ACIPENSERIDÆ. (26)

46.—**ACIPENSER** Linnaeus. (47)**101. Acipenser sturio oxyrhynchus** Mitchell. N. Ana. (74).**102. Acipenser transmontanus** Richardson. C. A. Ana. (75)**103. Acipenser medirostris** Ayres. C. A. Ana. (76)**104. Acipenser rubicundus** Le Sueur. Vn. (77)**105. Acipenser brevirostris** Le Sueur. N. S. (78)47.—**SCAPHIRHYNCHOPS** Gill. (48)**106. Scaphirhynchops platyrhynchus** Rafinesque. Vw. (79)ORDER K.—GINGLYMODI.<sup>1</sup> (I)

## Family XXVIII.—LEPIDOSTEIDÆ. (27)

48.—**LEPIDOSTEUS** Lacépède. (50)**107. Lepidosteus osseus** Linnaeus. V. (80)**108. Lepidosteus platystomus** Rafinesque. V. (81)**109. Lepidosteus tristæchus**<sup>2</sup> Bloch & Schneider. Vs. W. (82)

## ORDER L.—HALECOMORPHI. (J)

## Family XXIX.—AMIIDÆ. (28)

49.—**AMIA** Linnaeus. (51)**110. Amia calva** Linnaeus. V. (83)

<sup>1</sup>The word *Ginglymodi* is from γίγγλυμοδες, hinge, ειδος, like, in allusion to the ball-and-socket joints of the vertebrae.

<sup>2</sup>The subdivisions of *Lepidosteus* (*Cylindrosteus*; *Actrostosteus*) certainly have no value higher than specific, and the characters used in distinguishing them are variable and of slight importance. It is often difficult to distinguish *L. platystomus*, even specifically, from *L. tristæchus*. Specimens from Cuba (*tristæchus*) are not distinguishable from others from Florida (*spatula*).

## ORDER M.—NEMATOGNATHI. (K)

## Family XXX.—SILURIDÆ. (29)

## 50.—NOTURUS Rafinesque. (52)

§ *Schilbodes* Bleeker.

- 111. *Noturus gyrinus* Mitchell. Vn. (84)
- 112. *Noturus leptacanthus* Jordan. Vs. (85)
- 113. *Noturus nocturnus*<sup>1</sup> Jordan & Gilbert. Vw.
- 114. *Noturus funebris*<sup>2</sup> Gilbert & Swain. Vs.
- 115. *Noturus latifrons*<sup>3</sup> Gilbert & Swain. Vo.
- 116. *Noturus miurus*<sup>4</sup> Jordan. V. (86, 87)
- 117. *Noturus exilis*<sup>5</sup> Nelson. Vw. (88)
- 118. *Noturus insignis* Richardson. Ve. (89)

§ *Noturus*.

- 119. *Noturus flavus* Rafinesque. Vw. (90)

## 51.—LEPTOPS Rafinesque. (53)

- 120. *Leptops olivaris* Rafinesque. V. (91)

## 52.—GRONIAS Cope. (54)

- 121. *Gronias nigrilabris* Cope. Ve. (92)

## 53.—AMIURUS Rafinesque. (55)

- 122. *Amiurus brunneus* Jordan. Vse. (93)
- 123. *Amiurus platycephalus* Girard. Vse. (94)
- 124. *Amiurus melas*<sup>6</sup> Rafinesque. Vw. (95, 96)
- 125. *Amiurus nebulosus*<sup>7</sup> Le Sueur. V. (98)
- 125 b. *Amiurus nebulosus catulus*<sup>8</sup> Girard. Vsw.

<sup>1</sup> *Noturus nocturnus* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1885. Arkansas to Texas.

<sup>2</sup> *Noturus funebris* Gilbert & Swain, Proc. U. S. Nat. Mus., 1885. Northern Alabama.

<sup>3</sup> *Noturus latifrons* Gilbert & Swain, Proc. U. S. Nat. Mus., 1885. White River, Indiana.

<sup>4</sup> *Noturus eleutherus* seems to be inseparable from *Noturus miurus*.

<sup>5</sup> *Noturus elassochir* Swain & Kalb (Proc. U. S. Nat. Mus., 1882, 639) seems to me identical with *Noturus exilis*. I regard the latter as distinct from *N. insignis*. For a detailed review of the genus *Noturus*, see Swain & Kalb, *loc cit*.

<sup>6</sup> The species called in the Synopsis *Amiurus xanthocephalus* seems to be not distinct from *A. melas*. *Amiurus cragini* Gilbert, Bull. Washburn Lab. Nat. Hist., 1884, 1, 10, from Kansas, is identical with *Amiurus obesus* Gill, which I regard as the original *melas* of Rafinesque. *Amiurus brachyacanthus* Cope is probably the same species. The chief characters by which *A. melas* is distinguished from *A. nebulosus* are the much shorter pectoral spines and shorter anal fin of the former.

<sup>7</sup> The original *Silurus catulus* L. was certainly not this species, or any other North American siluroid. The oldest tenable specific name for this species is that of *nebulosus* Le Sueur.

<sup>8</sup> The type of *Pimelodus catulus* Girard should be referred to *A. nebulosus* rather than to *A. melas*. It represents a slight variety of *A. melas* occurring in the lower Mississippi Valley and Texas.

- 125c *Amiurus nebulosus marmoratus*<sup>1</sup> Holbrook. Vs. (97)  
 126. *Amiurus vulgaris* Thompson. Vn. (99)  
 127. *Amiurus natalis* Le Sueur. V. (100)  
 127b. *Amiurus natalis lividus* Rafinesque. V.  
 127c. *Amiurus natalis bolli* Cope. Vsw. (100b.)  
 128. *Amiurus erebennus*<sup>2</sup> Jordan. Vse. (101)  
 129. *Amiurus albodus*<sup>3</sup> Le Sueur. Ve. (102, 103)  
 130. *Amiurus lupus* Girard. Vsw. (104)  
 131. *Amiurus niveiventris* Cope. Vse. (105)  
 132. *Amiurus nigricans* Le Sueur. Vw. (106)  
 133. *Amiurus ponderosus*<sup>4</sup> Bean. Vw. (107)

54.—**ICTALURUS**<sup>5</sup> Rafinesque. (56)

134. *Ictalurus punctatus* Rafinesque. V. (108)  
 135. *Ictalurus furcatus* Cuv. & Val. Vsw. (109)

55.—**GALEICHTHYS**<sup>6</sup> Cuv. & Val. (57)

§ *Arius* Cuv. & Val.

136. *Galeichthys guatemalensis*<sup>7</sup> Günther. P.  
 137. *Galeichthys seemanni*<sup>8</sup> Günther. P.

<sup>1</sup> *Amiurus marmoratus* represents apparently a color variety only of *Amiurus nebulosus*. It inhabits grassy waters southward.

<sup>2</sup> Professor Cope describes (Proc. Ac. Nat. Sci., Phila., 1883, 133) a catfish from Batsto River, New Jersey, as a new species, under the name of *Amiurus prosthiostius*. Except that the caudal fin is said to be rounded rather than truncate, this species agrees with *A. erebennus*, with which species we think that it will prove identical. Greatest width of head equal to depth of body; eye small, 5 in interorbital width; dorsal spine inserted much nearer tip of snout than adipose fin; pectoral spines a little larger than dorsal spine; maxillary barbel reaching middle of pectoral spine; humeral process extending a little farther; black, whitish below; fins black; pectoral and ventral pale at base; head, 3½; depth, 4½. D. I. 6. A. 24 to 27. Batsto River, New Jersey. (Cope.)

<sup>3</sup> *Amiurus lophius* Cope seems to be the adult form of *A. albodus*.

<sup>4</sup> *Amiurus ponderosus* is perhaps the adult form of *A. nigricans*. The type of the former species has 35 anal rays. We have counted 25, 27, 28, and 32 anal rays in four individuals of *A. nigricans*.

<sup>5</sup> It is probably better, if the genus *Amiurus* is to be retained as distinct from *Ictalurus*, to refer to it all the transitional species having the tail forked and the bony bridge, from occiput to dorsal not quite continuous. It is true that this latter character is largely one of degree, but still there is a positive difference between *I. punctatus* and *furcatus* and the fork-tailed *Amiuri*.

6 **GALEICHTHYS** Cuvier & Valenciennes.

*Arius* (C. & V.); *Hexanematicthys*, *Guiritinga*, *Hemiarius*, *Cephalocassis*, *Netuma*, and *Pseudarius* Bleeker; *Notarius*, *Ariopsis*, and *Leptarius* Gill; *Sciadarius* and *Bagropsis* Kner; *Cathorops* Jor. & Gilb.).

(Cuvier & Valenciennes, Hist. Nat. Poiss., XV., 29, 1840; type *Galeichthys feliceps* C. & V.).

The genus *Arius*, distinguished from *Galeichthys* by having the nuchal shield ("occipital process") not covered by thick skin, cannot well be separated from *Arius*, as in several species (*dasycephalus*, *brandti* &c.) this character is simply sexual. For a full account of the species of this genus, found on the west coast of America, see Jordan & Gilbert, Bull. U. S. Fish Comm., 1882, 34.

<sup>7</sup> *Arius guatemalensis* Günther, V. 1864, 145; Jordan & Gilbert, Bull. U. S. Fish Comm., 1882, 48; Mazatlan to Panama.

<sup>8</sup> *Arius seemanni* Günther, V. 147; *Arius assimilis* Jordan & Gilbert, Bull. U. S. Fish Comm., 1882, 47 (not *A. assimilis* Günther); Mazatlan to Panama.

**138. *Galeichthys felis*** Linnæus. N. S. (110, 111)

**139. *Galeichthys platypogon*<sup>1</sup>** Günther. P.

**140. *Galeichthys brandti*<sup>2</sup>** Steindachner. P.

### 56.—**AELURICHTHYS** Baird & Girard. (58)

**141. *Aelurichthys marinus*** Mitchell. S. (112)

**142. *Aelurichthys panamensis*<sup>3</sup>** Gill. P.

**143. *Aelurichthys pinnimaculatus*<sup>4</sup>** Steindachner. P.

## ORDER N.—EVENTOGNATHI. (L)

### Family XXXI.—CATOSTOMIDÆ. (30)

#### 57.—**ICTIOBUS** Rafinesque. (59, 60, 61)

§ *Sclerognathus* Cuv. & Val. (59)

**144. *Ictiobus cyprinella*** Cuv. & Val. Vw. (113)

§ *Ictiobus*. (60)

**145. *Ictiobus urus*** Agassiz. Vw. (114)

**146. *Ictiobus bubalus*** Rafinesque. Vw. (115)

§ *Carpoides* Rafinesque. (61)

**147. *Ictiobus carpio*<sup>5</sup>** Rafinesque. Vw. (116)

**148. *Ictiobus velifer*<sup>6</sup>** Rafinesque. Vw. (120)

**148 b. *Ictiobus velifer bison*** Agassiz. Vw. (119)

**148 c. *Ictiobus velifer tumidus*** Baird & Girard. wV. (117)

<sup>1</sup> *Arins platypogon* Günther, V, 147; Jordan & Gilbert, Bull. U. S. Fish Comm., 1882, 44; Mazatlan to Panama.

<sup>2</sup> *Arins brandti* Steindachner, Ichethyol, Beitr., IV, 21, 1875; Jordan & Gilbert, Bull. U. S. Fish Comm., 1882, 39; Mazatlan to Panama.

<sup>3</sup> *Aelurichthys panamensis* Gill. Proc. Ac. Nat. Sci., Phila., 1863, 172 = *Aelurichthys nuchalis* Günther, V, 179, 1865 = *Aelurichthys panamensis* Jordan & Gilbert. Bull. U. S. Fish Comm., 1882, 35; Mazatlan to Panama.

<sup>4</sup> *Aelurichthys pinnimaculatus* Steindachner, Ichth., Beitr., IV, 15, 1875, Jordan & Gilbert, Bull. U. S. Fish Comm., 1882, 34; Mazatlan to Panama.

<sup>5</sup> This species is very distinct from the others referred to *Carpoides*. Its body is almost fusiform, the depth about 3 times in length, the head  $4\frac{1}{2}$ , and the first ray of the dorsal not more than half the length of the base of the fin.

<sup>6</sup> Excepting *I. carpio*, all the other specimens of *Carpoides* which I have examined from points west of the Allegheny Mountains seem to me to belong to a single extremely variable or polymorphous species, *I. velifer*. As varieties, we may perhaps recognize *tumidus* (= *grayi*), with high back and small eye; *bison* (= *damalis*), with large eye, moderate fins, and snout little obtuse; *velifer*, with snout little obtuse, and the dorsal fin very high, and *diformis*, with very blunt snout, large eye, and very high fins. These forms, however, appear to intergrade perfectly.

148d. *Ictiobus velifer* *deformis* Cope. Vw. (121)149. *Ictiobus cyprinus*<sup>1</sup> Le Sueur. Ve.58.—**CYCLEPTUS** Rafinesque. (62)150. *Cycleptus elongatus* Le Sueur. Vw. (122)59.—**PANTOSTEUS** Cope. (63)151. *Pantosteus plebeius*<sup>2</sup> Baird & Girard. R. (123, 124, 125)152. *Pantosteus generosus*<sup>3</sup> Girard. R. (126, 127)153. *Pantosteus guzmaniensis*<sup>4</sup> Girard. R. (128)60.—**CATOSTOMUS** Le Sueur. (64)154. *Catostomus araeopus* Jordan. T. (134)155. *Catostomus clarki*<sup>5</sup> Baird & Girard. R. (144)156. *Catostomus discobolus* Cope. R. (129)157. *Catostomus latipinnis* Baird & Girard. R. (130)158. *Catostomus nebulifer* Garman. R. (130e.)159. *Catostomus retropinnis* Jordan. R. (130)160. *Catostomus catostomus*<sup>6</sup> Forster. Vn. Y. (132)161. *Catostomus tahoensis* Gill & Jordan. R. (133)162. *Catostomus labiatus* Ayres. T. (133)163. *Catostomus macrochilus* Girard. T. (136)164. *Catostomus occidentalis* Ayres. T. (137)

<sup>1</sup> All the specimens of *Carpoides* from east of the Allegheny Mountains examined by me belong to a species closely related to *I. velifer*, but with the opercle nearly smooth, instead of strongly striate, as in the western species. In the eastern form, *I. cyprinus*, the eye is quite small, the body rather deep, and the dorsal fin rather high.

<sup>2</sup> *Pantosteus bardus* and *delphinus* are almost certainly identical with *P. plebeius*. The type of the latter species has the scales 90–30, less crowded forwards than in *P. generosus*; those before the dorsal much less reduced in size. Dorsal rays, 9; head, 4½; depth, 5; snout moderately broad, projecting; fins much lower than in *P. guzmaniensis*.

<sup>3</sup> *Pantosteus platyrhynchus* is based on shriveled specimens of *P. generosus*.

<sup>4</sup> The type of *Catostomus guzmaniensis*, lately examined by me, is a *Pantosteus*, and I am unable to distinguish it from the type of *P. virescens* on comparison of the two specimens. Lat. l. 100 in *guzmaniensis*. Scales before dorsal, 46 to 53; fins high.

<sup>5</sup> The type of *Catostomus clarki*, lately found, belongs to a species very closely related to *C. araeopus*, having the restricted fontanelle and cartilaginous lips of the latter species, but with the scales less crowded anteriorly, there being but 23 in a line before the dorsal instead of 42, as in *C. araeopus*. D. 11; lat. l. 70. *C. discobolus*, *C. araeopus*, and *C. clarki* mark a transition from *Catostomus* toward *Pantosteus*.

<sup>6</sup> Called in the text, *Catostomus longirostris*. The form described by Mr. Mather under the name of *Catostomus nanomyzon* should apparently be referred to this species. Brown; male with a red lateral band in the breeding season; head slender, flattened above; the snout shorter than in *C. catostomus*; lips thick, the lower with 3 or 4 rows of tubercles; eye large, 4 in head, 1½ in snout. Scales smaller anteriorly, but little crowded; dorsal higher than long; pectorals reaching front of dorsal; head, 4; depth, 5; D. 1, 10; A. 7; V. 9; scales, 14–99–11; L. (spawning specimens) 4½ inches. Big Moose Lake, Adirondack region. Apparently a dwarfed brook variety of *C. catostomus*, but inhabiting the same region and spawning at a much smaller size. (Mather.) (*Catostomus nanomyzon*, Twelfth Rept. Survey Adirondack Region, 1884, 36.)

165. *Catostomus bernardini*<sup>1</sup> Girard. T. (138)  
 166. *Catostomus ardens* Jordan & Gilbert. R. (139)  
 167. *Catostomus secundus* Cope & Yarrow. R. (140)  
 168. *Catostomus cypho* Lockington. R. (141)  
 169. *Catostomus insignis*<sup>2</sup> Baird & Girard. E. (142)  
 170. *Catostomus teres*<sup>3</sup> Mitchell. R. (143)

61.—**HYPENTELIUM**<sup>4</sup> Rafinesque.

171. *Hypentelium nigricans* Le Sueur. Vw. (145)

62.—**CHASMISTES** Jordan. (65)

172. *Chasmistes liorus* Jordan. R. (146)  
 173. *Chasmistes brevirostris* Cope T. (147)  
 174. *Chasmistes luxatus* Cope. T. (148)  
 175. *Chasmistes cujus*<sup>5</sup> Cope. R.

<sup>1</sup> The type of *Catostomus bernardini* is closely related to *C. occidentalis*, differing chiefly in the less conic form of the head and in the larger lower fins. Scales much crowded forwards; 31 before the dorsal (40 in *C. occidentalis*), 75 in the lateral line. Fontanelle large; lips broad, without cartilaginous sheath, formed as in *C. occidentalis*, the lower deeply incised; fins high, the dorsal longer than high, with 12 rays; caudal lobes equal; head 4½ in length.

<sup>2</sup> *Catostomus insignis* (type lately found) is closely related to *C. teres*, differing chiefly in the broader upper lip, which has several rows of tubercles upon it. Fontanelle rather small; no cartilaginous sheath on lower lips; scales considerably crowded anteriorly, much more so than in *C. clarkii*; 27 scales before dorsal; 56 in lateral line. D. 11.

<sup>3</sup> Called in the text, *Catostomus commersoni*. Although the *Cyprinus commersoni* of Lacépède is probably a sucker and may be this species, there is no certainty in so identifying it, the description being very imperfect and the type said to have been observed by Commerson in the East Indies; a statement apparently derived from a confusion of manuscripts of Commerson with those of Bosc. We think it better to retain for this species the later name of *teres*, concerning which no doubt exists. To this species apparently should be referred the small "June sucker" of the Adirondacks, described by Mather as *Catostomus utawana*. Olivaceous, white below; males without red in the breeding season; body slender; head not small, flattened above; snout little prominent; upper lip with two rows of papillæ; eye 4 in head; 2 in snout; dorsal as long as high; pectorals nearly reaching front of dorsal; head 4; D. 1, 11; A. 5; V. 9. Scales 9-67-8; length of adult 4½ inches. Blue Mountain Lakes, Adirondack region. (Mather.) Apparently a mountain race of *C. teres*. (Mather. Twelfth Rept., Survey Adirondack Region, N. Y., 35.)

"This small fish I was at first disposed to consider as a dwarfed mountain form of *C. commersoni*, but the fact that the latter fish is found in waters inhabited by this species, and while it grows to a length of 12 or more inches there, this little sucker barely reaches five. Added to this the fact that the larger species had finished spawning in the inlets in May, while this fish was found in masses in the swift mountain streams which tumble rapidly over rocks in the latter part of June, depositing their eggs, thereby showing that they are adult fish." (Mather.)

In view of the peculiar form of the cranium in *Catostomus nigricans*, contrasting with that seen in all the other *Catostominae*, it is probably well to regard it as the type of a distinct genus, *Hypentelium* Rafinesque.

<sup>5</sup> *Chasmistes cujus* Cope. *Couia*.

Pale olive; head broad and flat; upper lip very thin; lower lip represented by folds on each side, which do not connect around the symphysis; eye 8½ in head; in-

63.—**ERIMYZON** Jordan. (66)

- 176. Erimyzon sucetta**<sup>1</sup> Lacépède. Vs. (150)  
**176 b. Erimyzon sucetta oblongus** Mitchell. Vn. (149)

64.—**MINYTREMA** Jordan. (67)

- 177. Minytrema melanops** Rafinesque. Vw. (151)

65.—**MOXOSTOMA** Rafinesque. (68)

- 178. Moxostoma papillosum** Cope. Vse. (152)  
**179. Moxostoma velatum** Cope. Vw. (153)  
**180. Moxostoma pidiense** Cope. Vse. (155)  
**181. Moxostoma coregonus** Cope. Vse. (156)  
**182. Moxostoma album** Cope. Vse. (157)  
**183. Moxostoma thalassinum** Cope. Vse. (158)  
**184. Moxostoma valenciennesi**<sup>2</sup> Jordan. Vn. (159)  
**185. Moxostoma macrolepidotum** Le Sueur. Ve. (160)  
**185 b. Moxostoma macrolepidotum duquesnei** Le Sueur. Vw.  
**186. Moxostoma aureolum**<sup>3</sup> Le Sueur. Vn. (161)  
**187. Moxostoma crassilabre** Cope. Vse. (162)  
**188. Moxostoma congestum**<sup>4</sup> Cope. Vsw. (166)

terorbital space 4½; air-bladder with two cells; D. 12; A. 1, 8; scales, 13–65–11. Pyramid Lake, Nevada; in deep water. (Cope.) (*Chasmistes cujus* Cope, Proc. Ac. Nat. Sci., Phila., 1853, 149.)

This paper "On the Fishes of the Recent and Pliocene Lakes of the Western Part of the Great Basin and of the Idaho Pliocene Lake" contains an important discussion of the fish fauna of Nevada, Oregon, and Idaho, with description of numerous fossil forms not long extinct and closely allied to recent *Cyprinidae* and *Catostomidae*.

<sup>1</sup> The two forms of *Erimyzon* described in the Synopsis as *E. sucetta* and *E. goodei* seem to be geographical varieties of one species, southern specimens having the scales considerably larger and more regularly arranged than in northern ones. To the southern form belong the typical examples of *Moxostoma kennedyi* Girard and *Erimyzon goodei* Jordan. Specimens of this form have been examined by me, from streams of South Carolina, Georgia, Florida, Alabama, Louisiana, Illinois, and Texas. From Alabama, Louisiana, and Illinois I have seen specimens more or less distinctly intermediate, while from Virginia to Indian Territory (types *M. claviformis*) and northward only the small-scaled form occurs. It is probable that the original description of *Cat. succetta* Lac. belongs to the southern form (*kennedyi* = *goodei*). The northern form may then retain Mitchell's name, *oblongus*.

<sup>2</sup> *Moxostoma valenciennesi* Jordan, Proc. U. S. Nat. Mus., 1885 = *Catostomus carpio* C. & V., not of Raf.

<sup>3</sup> I now omit from the list, *Moxostoma bucco* Cope, based on the young of some species, probably of *M. aureolum*.

<sup>4</sup> I have recently found the types of *Catostomus congestus* and *Ptychostomus albodus*. They belong to the same species, a species shown by the late explorations of Jordan & Gilbert in Texas, to be very abundant in the waters of that State. The type of *P. albodus* has 44 scales in the lateral line instead of 56 as shown in Girard's figure. The specimens from Ash Creek, Arizona, referred with doubt to this species by Cope & Yarrow (Lieutenant Wheeler's Expl. Zoölogy, V. 680, 1876) belong apparently to *M. congestum*. The following account is taken from specimens taken by us in Lampasas River, at Belton, Tex.:

General form of *M. aureolum*, rather robust, moderately compressed, the back somewhat elevated. Head comparatively short, rather broad above and pointed anteriorly;

189. *Moxostoma conus* Cope. Vse. (163)  
 190. *Moxostoma anisurum* Rafinesque. Vw. (164)  
 191. *Moxostoma pœcilurum* Jordan. Vsw. (165)  
 192. *Moxostoma cervinum* Cope. Vse. (167)

**66.—PLACOPHARYNX** Cope. (69)

193. *Placopharynx carinatus* Cope.<sup>1</sup> Vw. (168)

**67.—QUASSILABIA** Jordan & Brayton. (70)

194. *Quassilabia lacera* Jordan & Brayton. Vw. (169)

Family XXXII.—CYPRINIDÆ. (31)

**68.—CAMPOSTOMA** Agassiz. (71)

195. *Campostoma ornatum*<sup>2</sup> Girard. Vsw. (170)  
 196. *Campostoma anomalum* Rafinesque. Vw. (171)  
 196b. *Campostoma anomalum prolixum* Storer. Ve. (172)  
 197. *Campostoma formosulum*<sup>3</sup> Girard. Vsw. (173)

**69.—OXYGENEUM** Forbes.

198. *Oxygeneum pulverulentum*<sup>4</sup> Forbes. Vw.

**70.—ACROCHILUS** Agassiz. (72)

199. *Acrochilus alutaceus* Agassiz & Pickering. T. (174)

**71.—ORTHODON** Girard. (73)

200. *Orthodon microlepidotus* Ayres. T. (175)

**72.—LAVINIA** Girard. (74)

201. *Lavinia exilicauda* Baird & Girard. T. (176)

**73.—CHROSOMUS** Rafinesque. (75)

202. *Chrosomus erythrogaster* Rafinesque. V. (177, 179)  
 203. *Chrosomus oreas*<sup>5</sup> Cope. Ve. (178)

**74.—ZOPHENDEUM** Jordan. (76)

204. *Zophendum siderium* Cope. R. (180)  
 205. *Zophendum plumbeum* Girard. Vsw. (181)

the snout a little projecting, mouth rather small, the lower lip full, formed as in *M. aureolum*; eye small, about 5 in head; dorsal fin unusually low and small, little elevated in front, its first ray, when depressed, reaching about to the middle of the last ray; caudal not deeply forked, the lobes equal; lower fins moderate.

Smoky yellowish-brown above, yellowish-silvery below; lower fins whitish; none of the fins red in life; the membranes of the dorsal always dusky. Head  $4\frac{1}{2}$  to  $4\frac{3}{4}$ ; depth 4; D. 12; scales 6-45-5; teeth as in *M. aureolum*. Streams of Texas to Arizona.

<sup>1</sup> Professor Gilbert thinks that this species may be the original *Moxostoma anisurum* of Rafinesque.

<sup>2</sup> The types of *Campostoma ornatum* have 73 scales in the lateral line. Those of *C. nasutum* agree in all respects with the ordinary *C. anomalum*.

<sup>3</sup> The types of *Campostoma formosulum* have 46 scales in the lateral line.

<sup>4</sup> *Oxygeneum pulverulentum* Forbes, Bull. Ills. Lab. Nat. Hist., 1885, 136. Peoria, Ills.

<sup>5</sup> *Chrosomus oreas* is a doubtful species, which I have not yet examined. *C. eos* is doubtless identical with *C. erythrogaster*.

75.—**DIONDA**<sup>1</sup> Girard. (77 pt.)

206. *Dionda melanops* Girard. Vsw. (189)  
 207. *Dionda punctifera* Garman. Vsw. (188b.)  
 208. *Dionda fluviatilis* Girard. Vsw. (188)  
 209. *Dionda amara* Girard. Vsw. (183)  
 210. *Dionda episcopa*<sup>2</sup> Girard. Vsw. (184, 187)  
 211. *Dionda serena*<sup>3</sup> Girard. Vsw. (185)  
 212. *Dionda nubila*<sup>4</sup> Forbes. Vw. (206)  
 213. *Dionda* (?) *haematura*<sup>5</sup> Cope. Vn. (204)

76.—**HYBOGNATHUS** Agassiz. (78)

214. *Hybognathus meeki*<sup>6</sup> Jordan & Gilbert. Vw.  
 215. *Hybognathus argyritis*<sup>7</sup> Girard. Vnw.  
 216. *Hybognathus nuchalis*<sup>8</sup> Agassiz. V. (182)  
 216 b. *Hybognathus placita*<sup>9</sup> Girard. Vw. (186)

<sup>1</sup>The genus *Dionda* may perhaps be recognized as distinct from *Hybognathus*. Its teeth are shorter than those of *Hybognathus*, and more or less distinctly hooked. The species are small in size and mostly dusky in coloration, being especially characteristic of the Rio Grande region.

<sup>2</sup>*Dionda episcopa* Girard, *Dionda texensis* Girard, *Dionda argentosa* Girard (types of these three examined by us)=*Hybognathus flaripiunis* Cope. Fairly described in the Synopsis under the name of *Hybognathus flaripinnis*. The number of scales in the lateral line is about 37 in the types of *episcopa* and *argentosa*, 37 to 39 in *texensis*, and 41 in *flaripiunis*. The anterior suborbitals are of moderate width in *D. episcopa*, about as in *Hybognathus nuchalis*.

<sup>3</sup>*Dionda serena* Girard = *Dionda chrysitis* Grd. = *Hybognathus nigrotenuis* Cope. Fairly described in the Synopsis under the latter name. The eye is smaller in *serena* than in *episcopa*, and the scales are larger (34 in the type of *D. serena*).

<sup>4</sup>Described in the Synopsis, page 167, as *Cliola nubila*. The species belongs, however, to *Dionda*, as has been already noticed by Professor Forbes. *D. nubila* is very close to *D. episcopa*, but from the specimens compared it appears to differ from the latter in the more pointed snout and in the larger mouth, the cleft of the mouth forming about one-fourth the length of the head, instead of one-fifth, as in *D. episcopa*.

<sup>5</sup>A doubtful species, unknown to me. The description points rather to this genus or *Cliola*, than to *Notropis*.

<sup>6</sup>*Hybognathus meeki* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1885. Ozark region of Missouri and Arkansas; abundant.

<sup>7</sup>The types of *Hybognathus argyritis* from the Upper Missouri belong to a species distinct from *H. nuchalis*, and are distinct from the species heretofore called *H. argyritis* by different authors. The suborbitals in *H. argyritis* are broad, as in *H. nuchalis* and *H. placita*, the anterior being about twice as long as deep; the mouth is larger than in the other species, its cleft extending nearly to the eye; the jaws subequal, the lower being acutish at tip. The species is known only from the Upper Missouri and the Red River of the North. *Hybognathus evansi* Girard is possibly the same, but the types are lost and the description is too brief for identification. It is more likely *H. nuchalis*.

<sup>8</sup>This species ranges from New Jersey to South Carolina, Texas, and Dakota. *H. osmerinus* and *H. regius* being indistinguishable from it. It has the suborbitals broad, the mouth small, the lower jaw short, blunt, and subhorizontal, and the eye large, about 4 in head.

<sup>9</sup>*Hybognathus placita*, now known from the Arkansas and Missouri Rivers, is closely related to *H. nuchalis*, but has the eye smaller, about 5 in head, the snout depressed and rather blunt; mouth very small.

216c. *Hybognathus nuchalis regia* Girard. Vse.

217. *Hybognathus hayi*<sup>1</sup> Jordan. Vs. (182b.)

77.—**PIMEPHALES**<sup>2</sup> Rafinesque. (78, 79, 80)

218. *Pimephales promelas*<sup>3</sup> Rafinesque. V. (190, 191)

218b. *Pimephales promelas confertus* Girard. Vnw. (192)

219. *Pimephales notatus*<sup>4</sup> Ratnesque. V. (193, 194)

78.—**EXOGLOSSUM** Rafinesque. (81)

220. *Exoglossum maxillingua* Le Sueur. Ve. (195)

79.—**COCHLOGNATHUS** Baird & Girard. (82)

221. *Cochlognathus ornatus* Baird & Girard. Vsw. (196)

222. *Cochlognathus biguttatus* Cope. Vsw. (197)

80.—**CLIOLA**<sup>5</sup> Girard. (84 pt.)

223. *Cliola vigilax*<sup>6</sup> Baird & Girard. Vw. (202, 203, 215)

81.—**NOTROPIS**<sup>7</sup> Rafinesque. (83, 84, 85)

§ *Hemitremia*. (83)

224. *Notropis bifrenatus* Cope Ve. (199)

225. *Notropis maculatus* Hay. Vs. (200)

226. *Notropis heterodon*<sup>8</sup> Cope. Vn. (201)

<sup>1</sup> *Hybognathus hayi* Jordan, Proc. U. S. Nat. Mus., 1884. Streams of Alabama, Mississippi, and the Lower Mississippi Valley. This species is correctly distinguished from *H. nuchalis* in the Synopsis, p. 968., under the erroneous name of *H. argyritis*. The species was first observed by Professor Hay.

<sup>2</sup> The genus *Hyborhynchus* is not distinct from *Pimephales*, the character of the lateral line being subject to many variations in *P. promelas*.

<sup>3</sup> *Coliseus parietalis* is, in my opinion, the young of *Pimephales promelas*. *Hyborhynchus confertus* is scarcely distinguishable from *P. promelas*, western specimens, Illinois to Texas, having the lateral line often complete, although usually more or less broken or irregular.

<sup>4</sup> *Hyborhynchus supereeliosus* is not distinct from *Pimephales notatus*. The skin at the angle of the mouth is thickened and produced in the males, but there is no true barbel.

<sup>5</sup> *Cliola* Girard (type *Cliola vigilax*) = *Hypargyrus* Forbes, Proc. U. S. Nat. Mus., 1884, 200 (type *Hybopsis tuditanus* Cope), may be regarded as a genus distinct from *Notropis*, having the short intestines, curved teeth, and other characters of *Notropis*, with the separated first dorsal ray, and the general appearance of *Pimephales notatus*.

<sup>6</sup> *Cliola vigilax* B. & G. = *Cliola relax* Girard = *Cliola rivar* Girard = *Hybopsis tuditanus* Cope = *Alburnops taurocephalus* Hay. This widely-diffused and abundant species is described in detail by Professor Gilbert, Proc. U. S. Nat. Mus., 1884, 200, under the name of *Hypargyrus tuditanus*.

<sup>7</sup> I find it impossible to maintain the distinctions given in the Synopsis, of *Hemitremia*, *Cliola* and *Minnilus*. I therefore follow Professor Gilbert (Proc. U. S. Nat. Mus., 1884, 201) in uniting all these little fishes in a single genus, *Notropis*, the latter generic name being the earliest applied to any of the group.

<sup>8</sup> *Hemitremia rittata* is here omitted. The species is perhaps not distinct from *N. bifrenatus* or *N. heterodon*. In any case the name *rittata* is preoccupied in *Notropis*. The number of teeth, 4-5, assigned to *H. rittata* by Professor Cope is probably an accidental variation or an error of observation. In some specimens, which as yet we are unable to separate from *N. heterodon*, the lateral line is complete, and the teeth 2, 4-4, 2. See Gilbert, Proc. U. S. Nat. Mus., 1884, 207.

§ *Alburnops* Girard.

227. *Notropis anogenus*<sup>1</sup> Forbes. Vw.  
 228. *Notropis spectrunculus* Cope. Vs. (205)  
 229. *Notropis illecebrosus*<sup>2</sup> Girard. Vw.  
 230. *Notropis?* *fretensis*<sup>3</sup> Cope. Vn. (207)  
 231. *Notropis longirostris* Hay. Vs. (208)  
 232. *Notropis nitidus*<sup>4</sup> Girard. Vsw.  
 233. *Notropis deliciosus*<sup>5</sup> Girard. Vw. (213)  
 233 b. *Notropis deliciosus stramincus* Cope. Ve. (209)  
 233 c. *Notropis deliciosus longiceps* Cope. Ve. (211)  
 233 d. *Notropis deliciosus volucellus* Cope. Vn. (210)  
 234. *Notropis procne* Cope. Ve. (214)  
 235. *Notropis giberti*<sup>6</sup> Jordan. Vw.

<sup>1</sup> *Notropis anogenus* Forbes. Bull. Ill. Lab. Nat. Hist., 1885, 138. Fox R., Ills.<sup>2</sup> For description of this species see Proc. U. S. Nat. Mus., 1885. The original types of *N. illecebrosus* closely resemble those of *N. blennius*, differing especially in the form of the anterior suborbital which is in this species very narrow. The snout is less convex than in *N. blennius*. Abundant in Western Arkansas. We are unable to find Girard's type of *Alburnops shumardi*, and regard that species as doubtfully a synonym of *A. illecebrosus*.<sup>3</sup> A doubtful species, unknown to me.<sup>4</sup> *Moniana nitida* Girard, Proc. Ac. Nat. Sci., Phila., 1856, 201, erroneously referred, in the Synopsis (p. 175), to the synonymy of *Notropis deliciosus*. From the latter species Girard's types differ mainly in the larger, more oblique, and less inferior mouth. The following description is from the original type, from Cadereita, Nuevo Leon:

Head,  $3\frac{2}{3}$ ; depth,  $3\frac{4}{5}$ ; D. 8; A. 7; scales, 5-32-4. Body, stout, rather deep: eye, smallish,  $3\frac{1}{2}$  in head; about equal to snout, and about  $\frac{1}{3}$  less than interorbital area, which is quite flat; margin of upper lip on level with pupil; mouth rather large, oblique; snout little pointed; maxillary reaching slightly past vertical from front of orbit, its length about  $3\frac{1}{6}$  in head; lower jaw shorter than upper, included when the mouth is closed; origin of dorsal slightly nearer tip of snout than base of caudal; about 12 scales in front of dorsal; tips of rays of dorsal all coterminous when the fin is deflexed; length of longest ray of dorsal  $1\frac{1}{2}$  in head; base of fin scarcely 2 in head; anal similar to dorsal; longest, ray 2 in head; base, 3 in head; pectorals reaching  $\frac{2}{3}$  distance to ventrals,  $1\frac{2}{3}$  in head; ventrals reaching  $\frac{2}{3}$  distance to anal,  $1\frac{2}{3}$  in head; teeth, 4-4, little hooked; color, brownish, a faint silvery band along sides, little wider than diameter of eye, a very small faint dark spot at base of caudal; fins all plain. Two specimens from Cadereita.

<sup>5</sup> The types of *Moniana deliciosa* Girard, Proc. Acad. Nat. Sci. Phila., 1856, 199, are identical with the species described in the Synopsis as *Cliola missurieus*. This form differs from *N. stramineus* Cope only in the somewhat greater size of the scales, there being 32 to 35 in the lateral line in *deliciosus*, 34 to 38 in *N. stramineus*. The latter, in our view, represents a slight variety found from Wisconsin to Tennessee, the true *deliciosus* ranging from Iowa to Texas.

*Hybopsis longiceps* Cope, from Virginia, appears also to represent a slight variety of *N. deliciosus*, with a more distinct dark lateral stripe, a rather longer preorbital region and slightly higher fins. Cope's type had the scales 5-33-2. A specimen from Fairfax, Va., has lat. l. 36. The identification of Rafinesque's *Minutilus microstomus* is too uncertain to warrant the use of his name.

*Hybopsis volucellus* Cope is unknown to me. It will probably prove to represent a variety of *N. deliciosus* with rather higher fins than usual.

<sup>6</sup> *Notropis giberti* Jordan & Meek, Proc. U. S. Nat. Mus. 1884. It is abundant with *N. deliciosus* in the streams of Iowa, Kansas, and Missouri. From the latter it is readily distinguished by the smaller eye and soiled coloration.

236. *Notropis scylla* Cope. Vw. (212)  
 237. *Notropis nocomis*<sup>1</sup> Jordan & Gilbert. Vsw.  
 238. *Notropis phenacobius*<sup>2</sup> Forbes. Vw.  
 239. *Notropis chlorus* Jordan. Vnw. (216)  
 240. *Notropis comalis*<sup>3</sup> Jordan & Gilbert. Vsw.  
 241. *Notropis pictolepis*<sup>4</sup> Cope. (256)  
 242. *Notropis topeka*<sup>5</sup> Gilbert. V.  
 243. *Notropis boops*<sup>6</sup> Gilbert. V.  
 244. *Notropis blennius*<sup>7</sup> Girard. V. (275)  
 245. *Notropis simus* Cope. Vsw. (218)

§ *Hudsonius* Girard.

246. *Notropis hudsonius*<sup>8</sup> Clinton. Vne. (221)  
 246b. *Notropis hudsonius amarus* Girard. Vse. (219, 220, 222)

§ *Codoma* Girard

247. *Notropis ornatus* Girard. Vsw. (226)

§ *Moniana* Girard.

248. *Notropis leoninus*<sup>9</sup> Girard. Vsw. (230)  
 249. *Notropis lutrensis*<sup>10</sup> Baird & Girard. Vw. (223, 224, 228, 229, 231, 238, 240)

<sup>1</sup> *Notropis nocomis* Jordan & Gilbert, Proc. U. S. Nat. Mus. 1885. Rio Comal, Texas.

<sup>2</sup> *Notropis phenacobius* Forbes, Bull. Ills. Lab. Nat. Hist., 1885, 137. Peoria, Ills.

<sup>3</sup> *Notropis comalis* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1885. Rio Comal, Texas.

<sup>4</sup> *Photogenes pictolepis* Cope. Cope's description is repeated in the Synopsis, p. 183, under the erroneous name of *Cliola zonata* (Ag.). Agassiz's species is a very different one, allied to *N. coccogenis*.

<sup>5</sup> *Cliola topeka* Gilbert, Bull. Washburn, Lab. Nat. Hist. Kas., 1884, 1, 13; description reproduced, Proc. U. S. Nat. Mus., 1884. Western Iowa and Kansas. The male of this species is bright red in life.

<sup>6</sup> *Notropis boops* Gilbert, Proc. U. S. Nat. Mus., 1884, 201. Indiana to Missouri.

<sup>7</sup> *Alburnops blennius* Girard, Proc. Ac. Nat. Sci. Phila., 1856, 194. This species closely resembles *N. illecebrosus*, but its suborbital bones are very much broader than in the latter species, and its anterior profile is more decurved. One of Girard's types has the teeth 1, 4-4, 0. Arkansas River at Fort Smith.

<sup>8</sup> *Clupea hudsonia* Clinton, Ann. Lyc. N. H. N. Y., 1824 = *Hudsonius fluviatilis* Girard, Proc. Ac. Nat. Sci. Phila., 1856, 210 = *Luxilus selene* Jordan, Bull. U. S. Nat. Mus. X. 60, 1877. Great Lakes and streams eastward as far south as the Susquehanna. Southward (Maryland to Georgia) it is replaced by the subspecies *amarus*, which, as stated in the text, differs only in having the teeth 1, 4-4, 0 or 1, instead of 2, 4-4, 2 or 1, as in the typical *hudsonius*. *Alburnops saludanus* Jordan & Brayton, and *Hudsonius curyoga* Bean seem to be simply color variations of *amarus*. *Rutilus storrianius* Kirtland has been incorrectly identified with *N. amarus*, it being a species of *Hybopsis*, (= *Ceratichthys lucens* Jordan).

<sup>9</sup> *Moniana leonina*, *complanata*, and *frigida* Girard. Of these nominal species I have found the types of *M. frigida* only. These seem to represent a species distinct from *N. lutrensis*, having the caudal peduncle more elongate, and 37 scales in the lateral line.

<sup>10</sup> *Leuciscus lutrensis* Baird & Girard = *Hypsilepis iris* Cope = *Moniana jugalis* Cope = *Moniana gibbosa* Girard = *Cyprinella forbesi* Jordan = *Moniana pulchella* Girard = *Moniana couchii* Girard = *Moniana gracilis* Girard = *Moniana lactabilis* Grd. = *Moniana rutila* Grd. = *Cyprinella billingsiana* Cope = ? *Cyprinella suavis* Girard.

Examination of the original types of the above nominal species, and of thousands

250. *Notropis proserpina*<sup>1</sup> Girard. Vsw. (233)  
 251. *Notropis formosus* Girard. Vsw. (234)  
 252. *Notropis callisema* Jordan. Vse. (227)

§ *Cyprinella* Girard.

253. *Notropis bubalinus*<sup>2</sup> Baird & Girard. Vw. (235, 236, 337)  
 254. *Notropis lepidus* Girard. Vw. (239)  
 255. *Notropis ludibundus* Girard. Vw. (242)  
 256. *Notropis garmani*<sup>3</sup> Jordan. Vsw. (236b.)  
 257. *Notropis macrostomus* Girard. Vsw. (241)  
 258. *Notropis notatus*<sup>4</sup> Girard. Vsw. (243)  
 259. *Notropis venustus* Girard. Vsw. (244)  
 260. *Notropis cercostigma*<sup>5</sup> Cope. Vsw. (276)  
 260b. *Notropis cercostigma stigmaturus* Jordan. Vs. (245, 253)  
 261. *Notropis whipplei*<sup>6</sup> Girard. Vn. (246, 247)  
 262. *Notropis galacturus* Cope. Vs. (248)  
 263. *Notropis camurus*<sup>7</sup> Jordan & Meek. Vw.  
 264. *Notropis eurystomus* Jordan. Vse. (249)  
 265. *Notropis niveus* Cope. Vse. (250)  
 266. *Notropis callistius* Jordan. Vs. (251)  
 267. *Notropis trichroistius* Jordan & Gilbert. Vs. (252)  
 268. *Notropis cœruleus* Jordan. Vs. (254)  
 269. *Notropis chloristius* Jordan & Brayton. Vse. (255)  
 270. *Notropis xænurus* Jordan. Vse. (257)  
 271. *Notropis pyrrhomelas* Cope. Vse. (258)  
 272. *Notropis hypselopterus* Günther. Vs. (259)

of specimens collected by the writer in different streams from Iowa to Southern Texas have convinced me that all belong to a single species, variable in depth of body according to sex and circumstances, but otherwise very constant.

<sup>1</sup> *Moniana proserpina* Girard, Proc. Ac. Nat. Sci. Phila., 1856, 199. This species is well separated from the others with which Dr. Girard has associated it, and seems to be the same as his *Moniana aurata*.

<sup>2</sup> *Leuciscus bubalinus* Baird & Girard = *Cyprinella umbrosa* Girard = *Cyprinella gunnisoni* Girard. The types of *C. umbrosa* have 32 scales in the lateral line; those of *C. gunnisoni* 34; the latter are young examples of the same species.

<sup>3</sup> *Cyprinella rubripinna* Garman, Bull. Mus. Comp. Zool., 1881, VIII, 91. The name *rubripinna* (*rubripinnis*) is twice preoccupied in the genus *Notropis*, as here understood.

<sup>4</sup> *Cyprinella notata* Girard. This is apparently a valid species, very close to *N. cercostigma*, but with larger scales (34) and a much fainter caudal spot. Specimens from Austin, Tex., agree fairly with Girard's types, which are in very bad condition.

<sup>5</sup> *Cyprinella cercostigma* Cope = *Luxilus chickasarensis* Hay = *Cliola urostigma* Jordan & Meek, Proc. U. S. Nat. Mus., 1884, 475. Specimens examined from Pearl River, Mississippi, and from nearly all the rivers of Texas from the Red to the Nueces. In all these specimens the number of scales in the lateral line is 37 to 39, while in specimens from the Alabama Basin (Etowah, Coosa, Alabama, Black Warrior) the number is from 42 to 44. I regard these as an Eastern variety, *stigmaturus* (*Photogenis stigmaturus* Jordan = *Cyprinella calliura* Jordan). Excepting the size of the scales and the more orange coloration of the fins in the var. *cercostigma*, I can detect no constant difference.

<sup>6</sup> I cannot distinguish *N. analostanus* from *N. whipplei*. Arkansas specimens have the body usually a little more elongate, but are not otherwise different.

<sup>7</sup> *Cliola eamura* Jordan & Meek, Proc. U. S. Nat. Mus., 1884, 474. Arkansas Basin, Colorado to Missouri.

§ *Luxilus* Rafinesque.

273. *Notropis megalops*<sup>1</sup> Rafinesque. Vn. (260, 272)  
 273b. *Notropis megalops frontalis* Agassiz. Vn.  
 273c. *Notropis megalops cyaneus* Cope. Ve.  
 274. *Notropis coccogenis* Cope. Vse. (262)  
 275. *Notropis zonatus*<sup>2</sup> Agassiz. Vw.  
 276. *Notropis zonistius* Jordan. Vse. (263)

§ *Hydroploch*<sup>3</sup> Jordan & Brayton.

277. *Notropis roseus* Jordan. Vs. (264)  
 278. *Notropis rubricroceus* Cope. Vse. (265)  
 279. *Notropis lutipinnis* Jordan & Brayton. Vse. (266)  
 280. *Notropis chlorocephalus* Cope. Vse. (267)  
 281. *Notropis chiliticus* Cope. Vse. (268)  
 282. *Notropis chalybaeus* Cope. Ve. (269)  
 283. *Notropis chrosomus* Jordan. Vs. (270)  
 284. *Notropis xænocephalus* Jordan. Vs. (271)  
 285. *Notropis lacertosus* Cope. Vs. (273)  
 286. *Notropis ariommus*<sup>4</sup> Cope. Ve. (277)  
 287. *Notropis scabriceps* Cope. Vw. (278)  
 288. *Notropis jejonus* Forbes. Vw. (279)  
 289. *Notropis leuciodus* Cope. Vs. (280)  
 290. *Notropis spilurus*<sup>5</sup> Gilbert & Swain. Vs.  
 291. *Notropis altipinnis* Cope. Vs. (281)  
 292. *Notropis amabilis* Girard. Vsw. (282)  
 293. *Notropis socius* Girard. Vsw. (283)  
 294. *Notropis swaini*<sup>6</sup> Jordan & Gilbert. Vsw.  
 295. *Notropis?* *bivittatus* Cope. Vw. (284)

§ *Lythrurus* Jordan.

296. *Notropis ardens*<sup>7</sup> Cope. Vs. (289)  
 296b. *Notropis ardens lythrurus* Jordan. Vn. (288)  
 296c. *Notropis ardens atripes* Jordan. Vw. (287)  
 296d. *Notropis ardens cyanocephalus* Copeland. Vn. (286)

<sup>1</sup> *Cyprinus megalops* Rafinesque, Amer. Monthly Magazine and Crit. Review, I, 121, December, 1817 = *Cyprinus cornutus* Mitchell, Amer. Monthly Mag., II, 324, February, 1818. The name of Rafinesque has, therefore, priority.

*Hybopsis plumbeolus* Cope seems to have been based on a young specimen of this species.

<sup>2</sup> *Alburnus zonatus* Agassiz, Bull. Mus. Comp. Zool., 1, 9, 1863. Abundant in the Ozark region of Missouri and Arkansas; a beautiful species, closely allied to *N. coccogenis*, but with smaller mouth and different coloration. For detailed description see Jordan & Gilbert, Proc. U. S. Nat. Mus., 1885.

<sup>3</sup> As the typical species of *Alburnops* Girard (*blennius*) has the teeth 1, 4-4, 0, the name *Hydroploch* may be adopted for this section, while *Alburnops* should supersede *Minilius*.

<sup>4</sup> *Notropis spilurus* Gilbert & Swain, Proc. U. S. Nat. Mus., 1885. Northern Alabama.

<sup>5</sup> *Alburnellus megalops* Girard. The name *megalops* is preoccupied in this genus. For a description of this abundant species, see Jordan, Proc. U. S. Nat. Mus., 1885.

<sup>6</sup> I now regard the forms called in the Synopsis, *diplænius* (*Minilus diplænius* Anct. (not *Semotilus diplænius* Rafinesque) = *Notropis lythrurus* Jordan, Proc. U. S. Nat. Mus., 1884, 476), *atrides*, *cyancephalus*, and *ardens* as varieties of a single species, of which the oldest tenable specific name is that of *ardens* Cope.

<sup>7</sup> *Alburnellus umbratilis* Girard = *Minilus nigripinnis* Gilbert, Bull. Washb. Lab. N. H., 1, 1884, 14 = *Luxilus lucidus* Girard = ? *Notropis macrolepidotus* Forbes. Bull. Ills. Lab. Nat. Hist., 1885, 138. Iowa to Arkansas, very abundant. See Jordan & Gilbert, Proc. U. S. Nat. Mus., 1885.

297. *Notropis umbratilis*<sup>1</sup> Girard. Vw. (296, 416)  
 298. *Notropis punctulatus* Hay. Vs. (290)  
 299. *Notropis roseipinnis*<sup>2</sup> Hay. Vs. (291)  
 300. *Notropis bellus* Hay. Vs. (292)  
 301. *Notropis matutinus* Cope. Vse. (293)  
 302. *Notropis lirus*<sup>3</sup> Jordan. Vs. (294)  
 303. *Notropis metallicus* Jordan & Meek. Vse.

§ *Notropis*.

304. *Notropis scepticus* Jordan & Gilbert. Vse. (297)  
 305. *Notropis photogenis* Cope. Vse. (298)  
 306. *Notropis telescopus* Cope. Vs. (299)  
 307. *Notropis stilbius* Jordan. Vs. (300)  
 308. *Notropis atherinoides*<sup>4</sup> Rafinesque. Vn. (302)  
 309. *Notropis dilectus*<sup>5</sup> Girard. Vw. (295, 303, 305)  
 310. *Notropis rubrifrons*<sup>6</sup> Cope. Vn. (301, 304)  
 311. *Notropis micropteryx* Cope. Vw. (306)

§ *Protoporus*<sup>7</sup> Cope. (86)

312. *Notropis*? *dominus* Cope. R. (307)  
 313. *Notropis*? *timpanogensis* Cope. R. (285)

82.—**ERICYMBÀ** Cope. (87)

314. *Ericymba buccata* Cope. Ve. (308)

83.—**PHENACOBIUS** Cope. (88)

315. *Phenacobius teretulus* Cope. Ve. (309)  
 316. *Phenacobius mirabilis* Girard. Vw. (310, 310b.)  
 317. *Phenacobius catastomus* Jordan. Vs. (311)  
 318. *Phenacobius uranops* Cope. Vs. (312)

84.—**TIAROGA** Girard.

319. *Tiaroga cobitis* Girard. R. (217)

85.—**RHINICHTHYS** Agassiz. (89)

320. *Rhinichthys cataractæ*<sup>8</sup> Cuv. & Val. Vn. (313)  
 320 b. *Rhinichthys cataractæ dulcis* Girard. Vw. (314)

<sup>1</sup> *Notropis roseipinnis* Hay, nom. sp. nov., for *Minnilus rubripinnis* Hay. The name *rubripinnis* is preoccupied in this genus. *Argyrenus rubripinnis* Heckel = *Notropis megalops*.

<sup>2</sup> *Notropis alabamae* Jordan & Meek, Proc. U. S. Nat. Mus., 1884, 476, seems to be identical with *Notropis lirus*, which again is doubtfully distinct from *N. matutinus*.

<sup>3</sup> *Notropis metallicus* Jordan & Meek, Proc. U. S. Nat. Mus., 1884, 475. Allamaha (Suwannee) River, Georgia.

<sup>4</sup> *Notropis atherinoides* Rafinesque = *Alburnus rubellus* Agassiz = ? *Minnilus dinemus* Rafinesque. The synonymy of this and related species is at present in much confusion.

<sup>5</sup> The types of *Alburnellus jemezanus* are shriveled and distorted. I am unable to see how they differ from *N. dilectus*.

<sup>6</sup> *Alburnellus percobromus* Cope seems to be indistinguishable from *N. rubrifrons*.

<sup>7</sup> The genus *Protoporus* is extremely doubtful, both the species referred to it being probably the young of *Squalius* or *Phoxinus*.

<sup>8</sup> Examination of large numbers of specimens of *Rhinichthys* from various parts of the United States has convinced me that not more than two distinct species can be

320c. *Rhinichthys cataractae transmontanus* Cope. R. (315)

321. *Rhinichthys atronasus* Mitchell. Vn. (316, 317)

#### 86.—**AGOSIA** Girard. (90)

§ *Agosia*.

322. *Agosia chrysogaster* Girard. R. (318)

323. *Agosia metallica* Girard. R. (319)

324. *Agosia novemradiata*<sup>1</sup> Cope. R.

§ *Apocode* Cope. (91)

325. *Agosia carringtoni* Cope. R. (320)

326. *Agosia nubila*<sup>2</sup> Girard. R. (321, 322, 323, 324)

327. *Agosia oscula*<sup>3</sup> Girard. R. (325)

#### 87.—**HYBOPSIS**<sup>4</sup> Agassiz (92)

§ *Nocomis* Girard.

328. *Hybopsis biguttatus*<sup>5</sup> Kirtland. V. (325, 327)

§ *Hybopsis*.

329. *Hybopsis cumingi* Günther. T. ? (329)

330. *Hybopsis storerianus*<sup>6</sup> Kirtland. Vw. (330)

recognized. *R. transmontanus* represents a tangible variety, occurring west of the Rocky Mountains and having a greater number of scales below the lateral line than I have ever seen in *R. cataractae*. *Rh. dulcis* has the snout shorter and blunter than usual in *cataractae*, projecting little beyond the mouth. Garman's review of this genus (Science Observer, 1881, 57) seems to me worse than useless.

<sup>1</sup> *Agosia novemradiata* Cope, Proc. Ac. Nat. Sci. Phila., 1883, 141. Silvery, dusky above and marked on sides with several rows of dusky spots; bases of lower fins and upper lip red; head elongate, especially the muzzle, which projects a little; eye 4½ in head, 1½ in muzzle, and in interorbital width; dorsal inserted behind ventrals; caudal peduncle rather deep; head 4; depth 5; D. always 1, 9; A. 1, 7; scales 11-60-11. Weber River, at Echo, Utah. (Cope.)

<sup>2</sup> On comparison of many examples, including the original types of *Apocode nubila*, *vulnerata*, and *henshawi*, I am unable to appreciate any permanent specific distinctions. The genus *Apocode* is scarcely distinct from *Agosia*.

<sup>3</sup> *Argyreas osculus* Girard = *Argyreas notabilis* Girard = *Apocode ventricosa* Cope. This species differs from *A. nubila* chiefly in the much smaller size of the scales. The original type of *A. osculus* has 90 scales in the lateral line, which is nearly complete.

<sup>4</sup> There is little doubt of the identity of *Hybopsis gracilis* Agassiz with *Ceratichthys amblops*. The name *Hybopsis* is therefore prior both to *Nocomis* and *Ceratichthys* as the designation of this genus.

<sup>5</sup> *Ceratichthys micropogon* Cope is probably based on an abnormal individual of *H. biguttatus*.

<sup>6</sup> *Rutilus storerianus* Kirtland = *Ceratichthys lucens* Jordan. By a curious mistake, Kirtland's species has been confounded by several recent writers with *Notropis amarus*, a species similar in appearance but lacking barbels. This handsome species reaches a length of 10 inches and is abundant in the lakes and river channels of the Mississippi Valley and the lake region. The teeth are usually 1, 4-4, 0.

331. *Hybopsis amblops* Rafinesque. Vw. (331)  
 331b. *Hybopsis amblops rubrifrons* Jordan. Vse. (332)  
 332. *Hybopsis hypsinotus* Cope. Vse. (333)

§ *Erinomus* Jordan.

333. *Hybopsis dissimilis* Kirtland. Vn. (334)  
 334. *Hybopsis monachus* Cope. Vs. (340)  
 335. *Hybopsis zanemus* Jordan & Brayton. Vse. (339)  
 336. *Hybopsis labrosus* Cope. Vse. (338)  
 337. *Hybopsis hyostomus*<sup>1</sup> Gilbert. Vw.  
 338. *Hybopsis montanus*<sup>2</sup> Meek. Vw.  
 339. *Hybopsis marconis*<sup>3</sup> Jordan & Gilbert. Vsw.  
 340. *Hybopsis aestivalis*<sup>4</sup> Girard. Vsw. (335, 336)  
 341. *Hybopsis gelidus*<sup>5</sup> Girard. Vnw. (337)

88.—**COUESIUS** Jordan. (93)

342. *Couesius squamilentus* Cope. Vnw. (341)  
 343. *Couesius dissimilis*<sup>6</sup> Girard. Vnw. (342.)  
 344. *Couesius plumbeus*<sup>7</sup> Agassiz. Vn. (343)  
 345. *Couesius physignathus* Cope. Vnw. (344)

89.—**PLATYGOBIO** Gill.

346. *Platygobio gracilis*<sup>8</sup> Richardson. Vnw. (345, 346)

90.—**SEMOTILUS** Rafinesque. (95)

347. *Semotilus atromaculatus*<sup>9</sup> Mitchell. V. (347)  
 348. *Semotilus thoreauianus* Jordan. Vs. (348)  
 349. *Semotilus bullaris* Rafinesque. Vne. (349)

<sup>1</sup> *Nocomis hyostomus* Gilbert, Proc. U. S. Nat. Mus., 1884, 203. Indiana, Iowa, to Tennessee; not rare in river channels.

<sup>2</sup> *Hybopsis montanus* Meek, Proc. U. S. Nat. Mus., 1884. Upper Missouri region.

<sup>3</sup> *Hybopsis marconis* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1885. Rio San Marcos, Texas.

<sup>4</sup> *Gobio aestivalis* Girard = *Ceratichthys sterletus* Cope. This species is allied to *H. hyostomus*, but has a much smaller eye; 4 to 4½ in head.

<sup>5</sup> *Hybopsis gelidus* is very pale in color, nearly or quite immaculate. The lower lobe of the caudal is dusky; the eye is small, 4 in head; and the scales are smaller than in related species, there being 44 in the lateral line. The barbel in these small fishes (*H. gelidus*; *aestivalis*; *hyostomus*; *zanemus*; *montanus*; *marconis*,) is much more developed than in any other of the American Cyprinidae.

The description in the Synopsis, of *Couesius dissimilis* is somewhat confused with that of *C. plumbeus*.

From the latter species *C. dissimilis* differs in the larger scales (60 instead of 68), the more decurved lateral line, and the more robust body. Mouth oblique, subterminal, resembling that of *Semotilus*. It is thus far known only from the Upper Missouri region.

<sup>7</sup> *Gobio plumbeus* Agassiz = *Nocomis milneri* Jordan = *Ceratichthys prosthemius* Cope. Adirondack region, northwest to Manitoba.

<sup>8</sup> I am unable to distinguish *Platygobio pallidus*, by the description, from *Platygobio gracilis*.

<sup>9</sup> The original *Cyprinus corporalis* of Mitchell is *Semotilus bullaris*. This species must therefore stand as *Semotilus atromaculatus*.

91.—**POGONICHTHYS** Girard. (96, 97)350. **Pogonichthys macrolepidotus**<sup>1</sup> Ayres. T. (350, 351)92.—**STYPODON** Garman. (97b.)351. **Styptodon signifer** Garman. R. (352)93.—**MYLOCHILUS** Agassiz. (98)352. **Mylochilus caurinus** Richardson. T. (353)94.—**MYLOPHARODON** Ayres. (99)353. **Mylopharodon conocephalus** Baird & Girard. T. (225)95.—**PTYCHOCHILUS** Agassiz. (100)354. **Ptychochilus oregonensis** Richardson. T. (355)355. **Ptychochilus rapax**<sup>2</sup> Girard. T. (356)356. **Ptychochilus harfordi** Jordan & Gilbert. T. (357)357. **Ptychochilus lucius** Girard. T. (358)96.—**GILA** Baird & Girard. (101)358. **Gila elegans** Baird & Girard. R. (359)359. **Gila robusta** Baird & Girard. R. (360)360. **Gila grahami** Baird & Girard. R. (361)361. **Gila affinis** Abbott. R. (362)362. **Gila gracilis** Baird & Girard. R. (363)363. **Gila emorii** Baird & Girard. R. (364)364. **Gila nacrea** Cope. R. (365)365. **Gila seminuda** Cope & Yarrow. R. (366)97.—**PHOXINUS**<sup>3</sup> Agassiz. (102, 103)§ *Clinostomus* Girard.366. **Phoxinus elongatus** Kirtland. Vn. (367)367. **Phoxinus vandoisulus** Cuv. & Val. Ve. (368)368. **Phoxinus estor** Jordan & Brayton. Vs. (369)369. **Phoxinus funduloides** Girard. Ve. (370)§ *Tigoma* Girard.370. **Phoxinus hydrophlox** Cope. R. (371)371. **Phoxinus tænia** Cope. R. (372)372. **Phoxinus montanus** Cope. R. (373)373. **Phoxinus humboldti** Girard. R. (374)

<sup>1</sup> The type of *Pogonichthys (Symmetrurus) argyriosus* is a young specimen of *Pogonichthys macrolepidotus*.

<sup>2</sup> The chief character in which the single known example of *P. rapax* differs from *P. oregonensis* is in the small size of the scales before the dorsal fin, there being 49 in *P. rapax* and about 42 in *P. oregonensis*.

<sup>3</sup> The character of the imperfection of the lateral line, which alone distinguishes *Phoxinus* from *Squalius*, as understood in the Synopsis, is of such slight importance and subject to such variations that I think best to merge the two groups in one. The name *Phoxinus* seems to have priority.

374. *Phoxinus galtiae*<sup>1</sup> Cope. R.  
 375. *Phoxinus cruoreus* Jordan & Gilbert. R. (375)  
 376. *Phoxinus ardesiacus* Cope. R. (376)  
 377. *Phoxinus pandora* Cope. R. (377)  
 378. *Phoxinus margaritus* Cope. Ve. (378)  
 379. *Phoxinus gula* Cope. R. (379)  
 380. *Phoxinus pulcher* Girard. R. (380)  
 381. *Phoxinus egregius* Girard. R. (381)  
 382. *Phoxinus lineatus* Girard. R. (382)  
 383. *Phoxinus gracilis* Girard. R. (383)  
 384. *Phoxinus conformis* Girard. T. (384)  
 385. *Phoxinus bicolor* Girard. T. (385) <sup>et al.</sup>  
 386. *Phoxinus obesus* Girard. R. (386)  
 387. *Phoxinus purpureus* Girard. R. (387)  
 388. *Phoxinus pulchellus* Baird & Girard. R. (388)  
 389. *Phoxinus intermedius* Girard. R. (389)  
 390. *Phoxinus aliciae* Jouy. R. (390)  
 391. *Phoxinus copei* Jordan & Gilbert. R. (391)  
 392. *Phoxinus niger* Cope. R. (392)  
 393. *Phoxinus conspersus* Garman. R. (393)

§ *Siboma* Girard.

394. *Phoxinus crassicauda*<sup>2</sup> Baird & Girard. T. (394)

§ *Squalius* Bonaparte.

395. *Phoxinus atrarius*<sup>3</sup> Girard. R. (395, 397)  
 396. *Phoxinus squamatus* Gill. (396)  
 397. *Phoxinus crassus* Girard. T. (398)

§ *Cheonda* Girard.

398. *Phoxinus cœruleus* Girard. T. (399)  
 399. *Phoxinus cooperi* Girard. T. (400)  
 400. *Phoxinus nigrescens*<sup>4</sup> Girard. R. (401)  
 401. *Phoxinus modestus* Garman. R. (402)

§ *Phoxinus*. (103)

402. *Phoxinus neogæus* Cope. Vn. (403)  
 403. *Phoxinus flammeus* Jordan & Gilbert. Vs. (404)  
 404. *Phoxinus milnerianus* Cope. Vn. (405)  
 405. *Phoxinus phlegethontis* Cope. R. (406)

<sup>1</sup> *Squalius galtiae* Cope, Proc. Ac. Nat. Sci. Phila., 1883, 148. Olive above as far as a plumbeous band which extends from the operculum to base of caudal. Below this line, sides and belly silver, except a broad band of crimson from the gill opening to front of anal; side of head with a dusky band. Dorsal inserted a little behind front of ventrals; muzzle short; mouth oblique, without prominent chin, the end of the maxillary reaching a little beyond front of orbit. Interorbital region gently and regularly convex as wide as eye. Head, 4; depth, 4½; eye, 3 in head; D. 1, 8; A (probably) 8, scales 12-60-5; teeth 1, 4-5, 1, without grinding surface. Pyramid Lake, Nevada; abundant. (Cope.)

<sup>2</sup> The earlier name, *Leuciscus gibbosus* Ayres, is preoccupied by *Leuciscus gibbosus* Storer.

<sup>3</sup> I have no doubt that *Squalius rhomaleus* Jordan & Gilbert is the adult form of *P. atrarius*. *P. squamatus* is, perhaps, also the same species. Several of the species of *Phoxinus* here admitted are of very doubtful validity.

<sup>4</sup> *Tigoma nigrescens* Girard = *Squalius lemmoni* Rosa Smith, Proc. Cal. Ac. Sci., 1883. *P. modestus* is perhaps also this species.

98.—*ALGANSEA*<sup>1</sup> Girard. (104)

406. *Algansea obesa* Girard. R. (408)  
 407. *Algansea symmetrica*<sup>2</sup> Baird & Girard. T. (409)  
 408. *Algansea bicolor* Girard. T. (410)  
 409. *Algansea parovana*<sup>3</sup> Cope. R. (411)  
 410. *Algansea thalassina*<sup>4</sup> Cope.  
 411. *Algansea antica* Cope. Vsw. (412)  
 412. *Algansea olivacea*<sup>5</sup> Cope. R.  
 413. *Algansea dimidiata*<sup>6</sup> Cope. R.

§ *Siphateles* Cope.

414. *Algansea vittata*<sup>7</sup> Cope. R.

<sup>1</sup> *Leucus* Heckel (preoccupied) = *Algansea* Girard = *Myloleucus* Cope. Professor Cope (Proc. Ac. Nat. Sci. Phila., 1883, 142) recognizes *Myloleucus* and *Leucus* as distinct genera; the former with teeth 4-5; the latter 5-5. Besides these, he proposes a third genus, *Siphateles* (l. c. 146), having the teeth 5-5, with grinding surface, and the lateral line incomplete. Such minute subdivision seems to me undesirable.

<sup>2</sup> *Pogonichthys symmetricus* Baird & Girard (Proc. Ac. Nat. Sci. Phila., 1854, 136) = *Algansea formosa* Girard (l. c. 1856, 183). The original type of *P. symmetricus* has the teeth 4-5, the maxillary without barbel, the head 4 in length, the depth 4 $\frac{1}{2}$ . Scales 9-33-6. I cannot distinguish it from *Algansea formosa*.

<sup>3</sup> Professor Cope regards *Myloleucus parovanus* as distinct from *Algansea bicolor*. It is described as follows:

Translucent, with a plumbeous lateral band; ventrals and pectoral, dusky; dorsal and caudal shaded with dark; body, rather stout; muzzle, short, conical; mouth, very broad, the maxillary reaching front of orbit; profile, gently arched; eye, large, 3 in head, equal to interorbital width; pectorals reaching little more than half way to ventrals; the latter just to vent. Head, 3 $\frac{1}{2}$ ; depth, 4 $\frac{1}{2}$ . D. 1, 9; A. 1, 8. Scales, 10-48-5. Teeth, 4-5. L., 12 inches (Cope). Beaver River, Utah; Goose Lake and Klamath Lake, Oregon; abundant.

(*Myloleucus parovanus* Cope, Proc. Am. Phil. Soc. Phila., 1874, 136; Cope & Yarrow, Zoöl. Wheeler Son, V. 669, 1876; Cope, Proc. Ac. Nat. Sci. Phila., 1883, 143.)

<sup>4</sup> *Myloleucus thalassinus* Cope. Slenderer than *M. parovanus*, and the color a light translucent green, quite unlike the heavy olivaceous of the latter. Head, 3 $\frac{1}{2}$ ; depth, 4 $\frac{1}{2}$ . A. 1, 9. Scales, 9-46-4. Teeth, 4-5. L., 6 inches. One specimen known, from Goose Lake, Oregon. (Cope, Proc. Ac. Nat. Sci. Phila., 1883, 143.)

<sup>5</sup> *Leucus oliraceus* Cope. Dusky olive; the belly silvery; no lateral band; fins dusky; body fusiform, compressed; head narrowed to the muzzle, the mouth opening obliquely forwards and upwards; maxillary concealed in the closed mouth, its tip extending a little beyond front of eye. Eye 1 $\frac{1}{2}$  in snout, 1 $\frac{1}{2}$  in interorbital space, 5 in head, middle of front flat, its edges sloping to the superciliary border. Head, 3 $\frac{1}{2}$ ; depth 4. A. 1, 8. Scales, 13-58-7. Teeth, 5-5, sharp edged. L., 1 foot. Pyramid Lake, Nevada; very abundant. (*Leucus oliraceus* Cope. Proc. Ac. Nat. Sci. Phila., 1883, 145.)

<sup>6</sup> *Leucus dimidiatus* Cope. Light brown above, becoming plumbeous lower, the belly pure silver-white. Eye equal to interorbital width, 3 $\frac{1}{2}$  in head, a little more than length of muzzle. Mouth oblique, the maxillary reaching front of eye. Ventral a little behind front of dorsal. Head, 4; depth 4 $\frac{1}{2}$ . A. 1, 8. Scales, 14-65-8. Teeth, 5-5. L., 4 inches. Pyramid Lake, Nevada; very abundant.

(*Leucus dimidiatus* Cope, Proc. Ac. Nat. Sci. Phila., 1883, 146.)

<sup>7</sup> *Siphateles vittatus* Cope. Brownish above, belly and sides silvery; a straight lateral band of lead-color interrupted at base of caudal by a vertical band of straw-yellow, which has a dark posterior edge. Lateral line very imperfect. Eye, 3 in head, a little less than interorbital width. Mouth oblique, the maxillary not quite reaching front of eye. Ventral fins beneath anterior part of dorsal. Head 4; depth,

99.—**OPSOPŒODUS**<sup>1</sup> Hay. (105, 106)415. *Opsopœodus emiliae* Hay. Vs. (413, 414)100.—**LUXILINUS**<sup>2</sup> Jordan, (gen. nov.).416. *Luxilinus occidentalis* Baird & Girard. T. (418)101.—**NOTE MIGONUS** Rafinesque. (107)417. *Notemigonus gardoneus* Cuv. & Val. Vse. (415)418. *Notemigonus chrysoleucus*<sup>3</sup> Mitchell. Vn. (417)418 b. *Notemigonus chrysoleucus boscii* Cuv. & Val. Vse. (419)102.—**RICHARDSONIUS** Girard. (108)419. *Richardsonius balteatus* Richardson. T. (421)420. *Richardsonius lateralis* Girard. T. (422)103.—**LEPIDOMEDA** Cope. (109)421. *Lepidomeda vittata* Cope. R. (423)422. *Lepidomeda jarrovii* Cope. R. (424)104.—**MEDA**<sup>4</sup> Girard. (110, 111)423. *Meda fulgida* Girard. R. (425)424. *Meda argentissima* Cope. R. (426)

4½. D. 1, 8; A. 1, 8. Scales, 11–55–5. Teeth, 5–5, with well developed grinding surface. L., 3 inches. Pyramid Lake, Nevada. (Cope, Proc. Ac. Nat. Sci. Phila., 1883, 146.)

<sup>1</sup> The genus *Trycherodon* should be suppressed, its typical species, *T. megalops*, being identical with *Opsopœodus emiliae*.

<sup>2</sup> **LUXILINUS** Jordan.

(Genus nova: type *Luxilus occidentalis* B. and G.) Ventral edge of moderate width; scaled over and not at all carinated; otherwise essentially as in *Notemigonus*. Gill rakers slender, of moderate length. Teeth 5–5 with entire edges and well developed grinding surface, their tips little hooked. Intestines of the short type, but longer than in most related genera. Anal basis elongate. (Name, a diminutive of *Luxilus*; from *lux*, light.)

<sup>3</sup> Specimens from Virginia, South Carolina, Georgia, and Florida (var. *boscii*) have 43 to 50 scales in the lateral line, and 15 to 17 rays in the anal fin. Specimens from various northern and western localities, Nova Scotia to Maryland, Louisiana, and Dakota (var. *chrysoleucus*) have 46 to 51 scales in the lateral line, and 12 to 14 anal rays. I regard the two forms as geographical varieties of one species. The name *Cyprinus americanus* is preoccupied, having been first given to a *Menticirrhus*.

<sup>4</sup> The types of *Meda fulgida*, lately found by me, have the teeth 2, 5–5, 2, not 1, 4–4, 1, as stated by Girard. The genus *Meda* is therefore identical with *Plagopterus*. The small barbel mentioned by Cope as a character of *Plagopterus*, I am unable to find either in *Meda* or *Plagopterus*.

*Meda fulgida* is closely allied to *Meda argentissima*, but has the eye a little larger, the snout shorter, the lower jaw more prominent. In form, size, coloration, and fin rays the two agree fully.

## Family XXXIII.—CHARACINIDÆ. (32)

105.—**TETRAGONOPTERUS** Cuvier. (114)

§ *Astyanax* Baird & Girard.

- 425.** *Tetragonopterus argentatus* Baird & Girard. Vsw. (429)

## ORDER O.—ISOSPONDYLI. (M)

## Family XXXIV.—ALEPOCEPHALIDÆ. (33)

106.—**ALEPOCEPHALUS** Risso. (115)

- 426.** *Alepocephalus bairdii* Goode & Bean. B. (430)

- 427.** *Alepocephalus agassizii*<sup>1</sup> Goode & Bean. B.

- 428.** *Alepocephalus productus*<sup>2</sup> Gill. B.

## Family XXXV.—ALBULIDÆ. (34)

107.—**ALBULA** (Gronow) Bloch & Schneider. (116)

- 429.** *Albula vulpes* Linnaeus. S. W. C. P. (116)

## Family XXXVI.—HYODONTIDÆ. (35)

108.—**HYODON** Le Sueur. (117)

- 430.** *Hyodon alosoides* Rafinesque. Vw. (432)

- 431.** *Hyodon tergisus* Le Sueur. Vw. (433)

- 432.** *Hyodon selenops* Jordan & Bean. Vsw. (434)

## Family XXXVII.—ELOPIDÆ. (36)

109.—**ELOPS** Linnaeus. (118)

- 433.** *Elops saurus* Linnaeus. S. W. P. (435)

110.—**MEGALOPS** Lacépède. (119)

- 434.** *Megalops atlanticus* Cuv. & Val. S. W. (436)

<sup>1</sup>*Alepocephalus agassizii* Goode & Bean.

Dusky; head and fins nearly black. Body a little deeper than in *A. bairdii*. Head compressed, the snout conically elongate, the lower jaw slightly produced; width of head  $9\frac{1}{2}$  in length of body (12 in *A. bairdii*). Eye  $3\frac{1}{2}$  in head ( $4\frac{1}{2}$  in *A. bairdii*). Scales parchment-like. Dorsal inserted directly above vent, the distance from its origin to base of caudal one-third its distance from front of eye. Anal inserted under second ray of dorsal. Length of pectoral equal to diameter of eye and  $10\frac{1}{2}$  in body. Ventral about one-sixth of head. Head 3; depth 5. D. 15; A. 17. Scales 10-90-11. Gulf Stream, lat.  $30^{\circ}$ , in 922 fathoms. (Goode & Bean.) (Goode & Bean, Bull. Mus. Comp. Zoöl., 1882, 215.)

<sup>2</sup>*Alepocephalus productus* Gill, Proc. U. S. Nat. Mus., 1883, 256. Gulf Stream, in deep water.

Family XXXVIII.—CHANIDÆ.<sup>1</sup>111.—**CHANOS**<sup>1</sup> Lacépède.**435. Chanos chanos**<sup>1</sup> Forskål. P.

## Family XXXIX.—CLUPEIDÆ.

112.—**DUSSUMIERIA**<sup>2</sup> Cuvier & Valenciennes.**436. Dussumieria stolifera**<sup>3</sup> Jordan & Gilbert. W.113.—**ETRUMEUS**<sup>4</sup> Bleeker. (120)**437. Etrumeus teres** DeKay. S. (437)114.—**CLUPEA** Linnæus. (122, 123)§ *Clupea*.**438. Clupea harengus** Linnæus. G. N. Eu. (437)**439. Clupea mirabilis**<sup>5</sup> Girard. A. C. (438, 440)<sup>1</sup> Family CHANIDÆ.

Clupeoid fishes, with the body oblong, compressed, covered with small, firm, adherent scales. Lateral line distinct. Abdomen broad and flattish; snout depressed; mouth small, anterior, the lower jaw with a small symphyseal tubercle; no teeth. Premaxillary joined to upper anterior edge of maxillary. Gill membranes broadly united; free from the isthmus. Branchiostegals 4; pseudo-branchiaæ well developed. An accessory branchial organ in a cavity behind the gill cavity. Dorsal fin opposite the ventrals; anal fin shorter than dorsal. Mucous membrane of œsophagus raised into a spiral fold. Intestine with many convolutions. Coloration silvery. Large fishes of the warmer parts of the Pacific. One genus and two species known (*Clupeidae*; group *Chania* Günther, VII, 473).

Genus **CHANOS** Lacépède.( *Lutodeira* Kuhl.)

(Lacépède Hist. Nat. Poiss., V, 395, 1803; type *Mugil chanos* Forskål = *Chanos araucicus* Lacépède.) Characters of the genus included above. (Χανός, the open mouth.) *Chanos chanos* (Forskål). Pacific and Indian Oceans; abundant in the Gulf of California and southward to Panama.

(*Mugil chanos* Forskål Deser. Anim., 74; *Mugil salmoninus* Forster, Bloch & Schneider, 121; *Chanos salmoninus* Günther, VII, 473, and of recent authors generally.)

<sup>2</sup> DUSSUMIERIA Cuvier & Valenciennes.(Hist. Nat. Poiss., XX, 467; type *Dussumieria acuta* Cuv. & Val.)

Body rather elongate, somewhat compressed; the abdomen rounded and without serratures. Mouth terminal, of moderate width, formed as in *Clupea*, but the maxillary more slender. Very small teeth in patches on jaws, palatines, pterygoids, and tongue. Scales cycloid, entire, very deciduous. Branchiostegals numerous, very slender. Ventrals inserted below middle or posterior part of dorsal; anal low, of moderate length. Pseudobranchiaæ well developed; pyloric cœca numerous. (Dedicated to M. Dussumier, a correspondent of Valenciennes, and the original discoverer of the typical species.)

<sup>3</sup> *Dussumieria stolifera* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1884, 25. Key West, Fla.

<sup>4</sup> The name *Etrumeus* is from *Etrumeiwasi*, the Japanese name of *Etrumeus micropus*. The genera, *Etrumeus* and *Spatelloides*, seem scarcely separable from *Dussumieria*.

<sup>5</sup> *Spatelloides bryoporus* Cope, the types of which species I have examined, seems to be identical with *Clupea mirabilis*.

§ *Sardinia* Poey.440. *Clupea sagax* Jenyns. C. (441)441. *Clupea pseudohispanica* Poey. W. (441b.)§ *Pomolobus* Rafinesque.442. *Clupea chrysocloris* Rafinesque. V. S. (442)443. *Clupea mediocris* Mitchell. N. (443)444. *Clupea vernalis* Mitchell. N. S. Ana. (444)445. *Clupea aestivalis* Mitchell. N. S. Ana. (445)§ *Alosa* Cuvier.446. *Clupea sapidissima* Wilson. N. S. Ana. (446)§ *Harengula* Cuv. & Val. (123)447. *Clupea sardina*<sup>1</sup> Poey. W.448. *Clupea thrissina*<sup>2</sup> Jordan & Gilbert. P.449. *Clupea pensacolæ* Goode & Bean. S. W. (447)450. *Clupea stolifera*<sup>3</sup> Jordan & Gilbert. P.115.—**OPISTHONEMA**<sup>4</sup> Gill. (124)451. *Opisthonema oglinum*<sup>5</sup> Le Sueur. S. W. (448)<sup>1</sup> *Clupea sardina* (Poey) *Sardina de ley*, “Pilehard.”

Greenish, sides silvery, the scales often shaded with light orange and dotted with black; a yellow scapular blotch; lips and dorsal fin yellow; older specimens with faint orange streaks along the rows of scales; tips of dorsal and caudal blackish. Body comparatively deep and compressed; lower jaw projecting; teeth in broad patches on jaws, vomer, palatines, and tongue; maxillary reaching nearly to middle of eye,  $2\frac{3}{4}$  in head. Eye very large, considerably longer than snout,  $2\frac{3}{4}$  in head; cheeks and opercles striate; gill rakers not very long, comparatively few; scales rather large, firm, each crossed by several conspicuous vertical ridges; scales not adherent, readily deciduous. Insertion of dorsal little before that of ventrals at a point considerably nearer snout than base of caudal. Dorsal a little higher than pectorals, its free edge concave; anal low; pectorals nearly reaching ventrals,  $1\frac{1}{2}$  in head. Head,  $3\frac{1}{2}$ ; depth,  $3\frac{1}{2}$ ; D. 1, 15; A. 18. Lat. 1, 36. Ventral acutes about  $15+10$ . L., 8 inches. Florida Keys to Cuba; abundant in schools. Readily distinguished from *Cl. pensacola* by the large eye and loose scales.

(*Harengula sardina* Poey, Memorias Cuba, II, 310, 1860; *Harengula sardina* Poey, Ennum. Pisc. Cubens., 1875, 147; ?? *Clupea macrophthalmus* Ranz., Nov. Com. Ac. Sci. Inst. Bonon., 1842, 320; ?? *Clupea humeralis* Cuv. & Val., XX, 293; not *Clupea macrophthalmus* nor *Clupea humeralis* Giinther. *Harengula sardina* Goode & Bean, Proc. U. S. Nat. Mus., 1879, 152; *Clupea sardina* Jordan, Proc. U. S. Nat. Mus., 1881, 106.)

<sup>2</sup> *Clupea thrissina* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 353. Cape San Lucas.

*Clupea stolifera* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1881, 339. Mazatlan to Panama.

<sup>3</sup> *Opisthonema oglinum* (Le Sueur) Goode & Bean.Omit from the synonymy *Clupea thrissa*<sup>6</sup> Osbeck, and add:

(*Megalops oglinus* and *M. notata* Le Sueur, Journ. Ac. Nat. Sci. Phila., I, 359, 361; *Chatōessus signifer* DeKay, New York Fauna Fishes, 1842, 264; *Opisthonema oglinum* Goode & Bean MSS.)

<sup>4</sup> The original basis of *Clupea thrissa* L. was a fish brought by Lagerström from China and described by Linnaeus's pupil, Odhel, in the Acten. Academ., V, 251, as *Clupea thryza*. This is a species of *Dorosoma*. To this latter genus belongs also the *Clupea thrissa* of Osbeck. In the synonymy of *Clupea thrissa* of the tenth edition of the *Systema Naturae*, several references to *Opisthonema* are included, while the *Clupea thrissa*, described in the twelfth edition as being received from Dr. Garden, is *Dorosoma cepedianum*. The *Clupea thrissa* of Broussonet and of most later authors is the *Opisthonema*, but the Linnean name must go with the original intention of its author.

452. *Opisthonema libertate*<sup>1</sup> Günther. P.116.—**BREVOORTIA** Gill. (125)453. *Brevoortia tyrannus* Latrobe. N. S. (450)453b. *Brevoortia tyrannus patronus* Goode. S. (449)117.—**OPISTHOPTERUS**<sup>2</sup> Gill.454. *Opisthopterus lutipinnis*<sup>3</sup> Jordan & Gilbert. P.Family XL.—**DOROSOMIDÆ**. (38)118.—**DOROSOMA** Rafinesque. (126)455. *Dorosoma cepedianum* Le Sueur. V. S. N. (451)456. *Dorosoma mexicanum* Günther. S. (451 b)Family XLI.—**ENGRAULIDÆ**. (39)119.—**STOLEPHORUS** Lacépède. (127)457. *Stolephorus ringens* Jenyns. C. P. (452)458. *Stolephorus macrolepidotus*<sup>4</sup> Kner & Steindachner. P.459. *Stolephorus opercularis*<sup>5</sup> Jordan & Gilbert. P.460. *Stolephorus browni* Gmelin. N. S. W. (453)461. *Stolephorus perthecatus*<sup>6</sup> Goode & Bean. S.

<sup>1</sup> *Meletta libertatis* Günther, Proc. Zool. Soc., Lond., 1866, 303; *Clupea libertatis* Günther, VII, 433; *Opisthonema libertate* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 622; Mazatlan to Panama, abundant.

<sup>2</sup> **OPISTHOPTERUS** Gill.(Proc. Ac. Nat. Sci. Phil., 1861; 31; type *Pristigaster tartoor* Cuv. & Val.)

Body elongate, very much compressed, with the abdomen prominent and strongly serrated. Scales thin, deciduous, of moderate size. Lower jaw projecting; teeth rather small, in villiform bands on both jaws, palatines, pterygoids and tongue; vomer toothless. Dorsal fin small, considerably behind middle of body. Anal fin very long. Ventrals wanting. Caudal deeply forked. Tropical parts of the Pacific. ( $\ddot{\text{O}}\pi\text{t}\omega\eta$ , behind;  $\pi\tau\epsilon\rho\sigma\tau$ , fin, the dorsal being placed further backward than in the closely related genus *Pristigaster*.)

<sup>3</sup> *Pristigaster lutipinnis* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1881, 340. Gulf of California and southward.

<sup>4</sup> *Stolephorus macrolepidotus* Kner & Steindachner. Body comparatively short and deep. Head one-fourth longer than deep. Snout very short, not projecting far beyond lower jaw. Jaws toothless. Maxillary narrow, rounded behind, extending to angle of preopercle. Abdomen slightly compressed. Scales adherent. Origin of dorsal slightly behind middle of body. Silvery, sides with an indistinct bluish band. Head  $3\frac{1}{2}$ ; depth 3, D. 12, A. 28. Scales 35-9. Mazatlan to Panama, one of the largest of the American species of *Stolephorus*.

(*Engraulis macrolepidotus* Kner & Steindachner, Abhandl. Bayer. Akad. Wiss. X, 1864; *Engraulis macrolepidotus* Günther, VII, 385.)

<sup>5</sup> *Stolephorus opercularis* Jordan & Gilbert. Proc. U. S. Nat. Mus., 1881, 275. (Gulf of California.)

<sup>6</sup> *Stolephorus perthecatus* Goode & Bean., Proc. U. S. Nat. Mus., 1882, 434.

Pensacola, Fla. Apparently distinguished from *S. browni* by the short anal and from *S. perasciatus* by the long maxillary.

462. *Stolephorus ischanus*<sup>1</sup> Jordan & Gilbert. P.  
 463. *Stolephorus perfasciatus*<sup>2</sup> Poey. W.  
 464. *Stolephorus eurystole*<sup>3</sup> Swain & Meek. N. (455)  
 465. *Stolephorus curtus*<sup>4</sup> Jordan & Gilbert. P.  
 466. *Stolephorus mitchilli* Cuv. & Val. N.S. (454 b.)  
 467. *Stolephorus exiguis*<sup>5</sup> Jordan & Gilbert. P.  
 468. *Stolephorus miarchus*<sup>6</sup> Jordan & Gilbert. W. P.  
 469. *Stolephorus delicatissimus* Girard. C.  
 470. *Stolephorus lucidus*<sup>7</sup> Jordan & Gilbert. P.  
 471. *Stolephorus compressus* Girard. C.

## Family XLII.—ALEPIDOSAURIDÆ. (40)

120.—PLAGYODUS<sup>8</sup> Steller. (128)

472. *Plagyodus ferox* Lowe. B. (458)  
 473. *Plagyodus aesculapius* Bean. A. (458 b.)  
 474. *Plagyodus borealis* Gill. C.A. (459)

## Family XLIII.—PARALEPIDIDÆ. (41)

## 121.—SUDIS Rafinesque. (129)

§ *Sudis*.

475. *Sudis ringens* Jordan & Gilbert. B. P. (459)

§ *Arctozenus* Gill.

476. *Sudis borealis*<sup>9</sup> Reinhardt. G. A. B. (461, 462)

<sup>1</sup> *Stolephorus ischanus* Jordan & Gilbert., Proc. U. S. Nat. Mus., 1881, 340. Mazatlan southward. Closely related to *S. browni*.

<sup>2</sup> *Stolephorus perfasciatus* (Poey).

Body rather elongate; snout compressed and pointed, shorter than eye. Top of head with a slight keel. Eye  $3\frac{1}{2}$  in head. Maxillary and lower jaw finely toothed; maxillary unusually short, its posterior end rounded, not extending quite to margin of preopercle; gill rakers numerous; pectoral  $1\frac{1}{2}$  in head, not reaching ventrals; insertion of anal below last rays of dorsal, the fin short; origin of dorsal midway between root of caudal and pupil. Color of *S. browni*, the lateral band rather narrower, well defined, its width about  $\frac{1}{4}$  eye; no dark punctulations except on base of caudal and sometimes on anal. Head  $4\frac{1}{2}$ ; depth 6, D. 12, A. 14 to 16, L. 2 to 3 inches. (Swain & Meek.) Florida Keys to Cuba, common, but much less abundant than *S. browni*.

(*Engraulis perfasciatus* Poey, Mem. Cuba, II, 313, 1858. *Engraulis perfasciatus* Giinther, VII, 391; not of Swain. Bull. U. S. Fish. Comm., 1882, 55, nor of Jor. & Gilb., Synopsis, 273; Swain & Meek, Proc. Ac. Nat. Sci. Phila. 1884.)

<sup>3</sup> *Stolephorus eurystole* Swain & Meek, Proc. Ac. Nat. Sci. Phila. 1884, 35. Wood's Holl. Mass. This is the species described in the Synopsis, p. 273, under the erroneous name of *S. perfasciatus*.

<sup>4</sup> *Stolephorus curtus* Jordan & Gilbert. Proc. U. S. Nat. Mus., 1881, 343. Mazatlan.

<sup>5</sup> *Stolephorus exiguis* Jordan & Gilbert. Proc. U. S. Nat. Mus., 1881, 342.

<sup>6</sup> *Stolephorus miarchus* Jordan & Gilbert. Proc. U. S. Nat. Mus., 1881, 344; 1882, 622; 1884, 106, Key West; Mazatlan, Panama. The smallest of the American anchovies.

<sup>7</sup> *Stolephorus lucidus* Jordan & Gilbert. Proc. U. S. Nat. Mus., 1881, 341. Mazatlan.

<sup>8</sup> It is probably best to substitute Steller's name, *Plagyodus*, for the later *Alepidosaurus*.

<sup>9</sup> *Sudis coruscans* is probably not specifically distinct from *S. borealis*.

Family XLIV.—SYNODONTIDÆ.<sup>1</sup> (42 part.)122.—**SYNODUS** (Gronow) Bloch & Schneider.§ *Synodus*.

477. *Synodus fœtens* Linnæus. S. (463)  
 478. *Synodus spixianus*<sup>2</sup> Poey. W.  
 479. *Synodus scituliceps*<sup>3</sup> Jordan & Gilbert. P.  
 480. *Synodus lucioceps* Ayres. C. (464)  
 481. *Synodus anolis*<sup>4</sup> Cuv. & Val. W. (464b.)

§ *Trachinocephalus* Gill.

482. *Synodus myops* Forster. S. W. (465)

123.—**BATHYSAURUS**<sup>5</sup> Günther.

483. *Bathysaurus agassizii* Goode & Bean. B.

## Family XLV.—SCOPELIDÆ. (42)

124.—**MYCTOPHUM** Rafinesque. (131)

484. *Myctophum crenulare* Jordan & Gilbert. C. (466)

<sup>1</sup> Apparently those genera of the group called in the synopsis *Scopelidae*, which have the maxillary rudimentary and adnate to the premaxillary, or sometimes entirely wanting, should be detached from *Scopelidae*, to form a separate family, which has been called *Synodontidae* by Professor Gill. To this group belong, in our fauna, the genera *Synodus* and *Bathysaurus*, as well as the Old World genera of *Harpodon* and *Saurida*.

<sup>2</sup> *Synodus spixianus* Poey. *Lagarto : Soap-fish.*

Sandy gray, light or dark, much mottled above with darker olive; branchiostegals pale yellowish; top of head without distinct vermiculations; dorsal scarcely barred; caudal dusky; other fins pale, with little or no yellow in life; lower parts of head mottled with dusky. No scapular spot; tip of snout not black. General form and appearance of *S. fœtens*, the teeth rather stronger; the jaws a little longer; the upper  $1\frac{1}{2}$  in head. Dorsal fin shorter and higher, its free edge more oblique than in *S. fœtens*, its anterior rays when depressed extending beyond the tips of the posterior,  $1\frac{1}{2}$  in head. Scales about as in *S. fœtens*. Pectorals 2 in head; ventrals  $1\frac{1}{4}$ . D. 1, 9. A. 11 or 12. Lat. 1. 60. Florida Keys and Cuba. Abundant.

(*Saurus spixianus* Poey. *Memorias Cuba*, ii, 304, 1860; Poey, *Enum. Pisc. Cubens.*, 1875, 141; Jordan, *Proc. U. S. Nat. Mus.*, 1884, 107.)

For a detailed account of this and other American species of *Synodus*, see Meek, *Proc. Ac. Nat. Sci. Phila.*, 1884, 130.

<sup>3</sup> *Synodus scituliceps* Jordan & Gilbert, *Proc. U. S. Nat. Mus.*, 1881, 344. Mazatlan to Panama.

<sup>4</sup> The species described in the Synopsis (p. 889) as *Synodus intermedius*, is not that species, but a different one, *Saurus anolis* Cuv. & Val., xxii, 1849, 438 = *Synodus cubanus* Poey, *Enum. Pisc. Cubens.* 1875, 143. *Saurus intermedius* Agassiz & Spix. = *Synodus intermedius* Poey, *Enum. Pisc. Cubens.* 1875, 143, has the mouth smaller than in *S. anolis*, the scales larger (lat. 1. 45), the scapular region without distinct black spot, and the coloration less variegated. *S. intermedius* is common in Cuba, but has not yet been noticed in our waters. In the adult of *S. anolis*, the lower parts are marked by stripes formed by an orange spot on each scale; the number of cross-bars is usually doubled by the presence of a shorter one between each pair.

<sup>5</sup> *BATHYSAURUS* Günther.

(Günther *Ann. Mag. Nat. Hist.*, Aug., 1878, 181); type *Bathysaurus ferox* Günther.) Body formed as in *Synodus*, subcylindrical, elongate, covered with small scales.

**485. Myctophum mülleri**<sup>1</sup> Gmelin. G. (467)

**486. Myctophum boops**<sup>2</sup> Richardson. A.

**125.—MAUROLICUS<sup>3</sup>** Cooco. (132)

**487. Maurolicus borealis** Nilsson. B. (468)

Head depressed, with the snout produced, flat above. Cleft of the mouth very wide, with the lower jaws projecting; premaxillary very long, styliform, tapering, not movable; maxillary obsolete. Teeth in the jaws in broad bands, not covered by lips, curved, unequal in size, and barbed at the end; a series of similar teeth along the whole length of each side of the palate; a few teeth on the tongue, and groups of small teeth on the hyoid; eye moderate, lateral. Pectoral moderate; ventrals 8-rayed, inserted close behind pectoral. Dorsal fin median, of about 18 rays; adipose fin present or absent; anal moderate; caudal emarginate. Gill openings very wide, the gill membranes separate, free from the isthmus. Branchiostegals 11 or 12. Gill laminae well developed; gill-rakers tubercular; pseudobranchia well developed. Scales rather small. Deep-sea fishes. (*Bathysaurus*, deep; *σαυρος*, *saurus* = *Synodus*.)

*Bathysaurus agassizii* Goode & Bean.

Body elongate, subterete. Head alligator-like, naked, except on cheek and occiput, with strong nasal and interorbital ridges; its greatest width more than half its length; gape of mouth very wide, one-sixth length of body, extending behind eye for a distance equal to interorbital width. Premaxillary with two irregular rows of depressible teeth, some of them barbed, those of inner row much the largest; lower jaw enormously strong, its sides projecting beyond the upper jaw; its dentary edge thickly studded with depressible teeth, many of them, especially the larger inner ones, strongly barbed; those in front, claw-like, recurved; three rows of teeth on the palatines, the middle ones very much enlarged and most of them strongly barbed, these being the largest of all the teeth. On the tongue a few weaker teeth, and groups of similar teeth on the vomer. Insertion of dorsal behind snout at a distance a little more than its own base and about one-third the total length; longest ray equal to greatest depth of body. No adipose dorsal (in the specimen known); anal inserted considerably behind last ray of dorsal, its base about half that of the dorsal. Ventrals well apart, inserted just in front of dorsal, their length half head. Pectoral as long as lower jaw, its seventh ray prolonged to a length equal to that of head. Caudal slightly forked; scales thin, cycloid, deciduous, those of the lateral line larger, brownish; lining of gill cavity blue-black. Head, 3½; depth, 7. B. 10, D. 17, A. 11, C. 19, P. 15, A. 8. Scales, 8-78-. Length, 18 inches.

Gulf Stream, lat. 33°, at a depth of 647 fathoms. (Goode & Bean.)

(Goode & Bean, Bull. Mus. Comp. Zoöl., 1882, 215.)

<sup>1</sup>This species should stand as *Myctophum mülleri* instead of *M. glaciale*. To the synonymy add: *Salmo mülleri* Gmelin, Syst. Nat. 1788, 1378; *Scopelus mülleri*, Collet, Norske Nordhav Exped., 1880, Fiske, 158; *Scopelus mülleri* Goode & Bean, Bull. Mus. Comp. Zoöl., 1882, 223.

This species has been lately taken in the deep waters off Southern New England.

<sup>2</sup>*Myctophum boops* Richardson.

Depth of head 1½ in its length; eye nearly 3 in head; twice its distance from preopercle. Snout short, obtuse, its upper profile descending in a strong curve; jaws equal; maxillary reaching nearly to angle of preopercle, slightly and gradually dilated behind; cleft of mouth very slightly oblique. Origin of dorsal considerably nearer tip of snout than root of caudal, above base of ventrals; its last ray before origin of anal; pectoral reaching vent. Scales smooth, thin, and deciduous. Head 3½; depth 5. D. 14. A. 21, V. 8. Scales 3-38-5. L. 4½ inches. Vancouver's Island. (Günther).

(Richardson, Zoöl. Erebis and Terror. Fishes, 39, pl. 27. *Scopelus boops*, Günther, V, 408.)

<sup>3</sup>According to Professor Gill, the genus *Maurolicus* belongs to the *Scopelidae* and not to the *Sternopychidae*.

Family XLVI.—HALOSAURIDÆ.<sup>1</sup>126.—**HALOSAURUS** Günther.488. **Halosaurus macrochir** Günther. B.

## Family XLVII.—STOMIATIDÆ. (45)

127.—**STOMIAS** Cuvier. (134)489. **Stomias ferox** Reinhardt. B. (470)128.—**HYPERCHORISTUS**<sup>2</sup> Gill.490. **Hyperchoristus tanneri** Gill. B.<sup>1</sup> Family HALOSAURIDÆ.

Body elongate, compressed posteriorly, tapering into a very long and slender tail, which becomes compressed and narrowed into a sort of filament. Abdomen rounded. Scales rather small, cycloid, deciduous. Sides of head sealy; lateral line present, running along the sides of the belly, its scales, in the known species, enlarged, each in a pouch of black skin with a phosphorescent organ at its base. No barbels. Head subconical, depressed anteriorly, the flattened snout projecting beyond the mouth. Mouth inferior, horizontal, of moderate size, its anterior margin formed by the premaxillaries, its lateral margin by the maxillaries, which are of moderate width. Teeth small, in villiform bands, on the jaws, vomer, palatines, and tongue. Eye rather large. Facial bones with large muciferous cavities. Preopercle produced behind in a large flat process, "replacing the sub- and interoperculum." Bones of head unarmed. Gills 4, a slit behind the fourth. Pseudobranchia none. Gill-rakers short. Gill membranes separate, free from the isthmus. Branchiostegals numerous (about 14). Dorsal fin short, rather high, inserted behind ventrals and before vent. No adipose fin; no caudal fin. Anal fin extremely long, extending from the vent to the tip of the tail (its rays about 200 in number). Ventrals moderate, not very far back. Pectorals rather long, narrow, inserted high. No axillary scales. Air bladder large, simple. Stomach eæcal; pyloric cæca in moderate number; intestines short. Ovaries closed. No phosphorescent spots. A single genus<sup>1</sup> with about 5 species; fishes of the deep sea. (*Halosaurida* Günther, VII, 482.)

**HALOSAURUS** Johnson.

(Johnson, Proc. Zool. Soc. London, 1863, 406; type *Halosaurus oweni*, Johnson, from Madeira). Characters of the genus included above. (*ἅλς*, sea; *σαυρος*, lizard.)

*Halosaurus macrochir* Günther.

Everywhere blackish, the color nearly uniform. Snout moderate, its length from mouth 7 in length of head; eye small,  $7\frac{1}{2}$  in head, 2 in interorbital space. Length of head slightly greater than its distance from ventral. Maxillary reaching vertical from front of eye; its length from tip of snout  $2\frac{1}{2}$  in head. Insertion of dorsal entirely behind the ventrals. Ventrals midway between preopercle and front of anal, their length  $2\frac{5}{8}$  in head. Pectorals nearly reaching ventrals,  $1\frac{1}{2}$  in head. Base of dorsal  $3\frac{1}{3}$  in head, its longest ray 2. B. 12. D 1, 10, or 11, V. 9. Deep waters of the Atlantic; not rare in the Gulf Stream.

(Günther, Ann. Mag. Nat. Hist., 1878, 251; Goode & Bean, Bull. Mus. Comp. Zool., 1882, 219. *Halosaurus goodei* Gill, Proc. U. S. Nat. Mus., 1883, 257.)

<sup>2</sup> *HYPERCHORISTUS* Gill.

(Gill, Proc. U. S. Nat. Mus., 1883, 256; type, *Hyperchoristus tanneri* Gill.)

"Stomiatids, with a robust claviform body, naked skin, teeth on the jaws nearly uniserial, but in several groups, of which the successive teeth (about 4) rapidly

129.—**ECHIOSTOMA** Lowe. (135)491. **Echiostoma barbatum** Lowe. B. (471)130.—**MALACOSTEUS**<sup>1</sup> Ayres. (136)492. **Malacosteus niger** Ayres. B. (472)131.—**ASTRONESTHES** Richardson. (137)493. **Astronesthes niger** Richardson. B. (473)Family XLVIII.—**ARGENTINIDÆ**.<sup>2</sup> (46 part.)132.—**MICROSTOMA** Cuvier. (138)494. **Microstoma grœnlandicum** Reinhardt. G. (474)133.—**MALLOTUS** Cuvier. (140)495. **Mallotus villosus** Müller. A. G. (475, 476)134.—**THALEICHTHYS** Girard. (141)496. **Thaleichthys pacificus** Richardson. A. Ana. (477)135.—**OSMERUS** Linnæus. (142)497. **Osmerus thaleichthys**<sup>3</sup> Ayres. C. (478)498. **Osmerus mordax** Mitchell. N. Ana. (480)499. **Osmerus dentex** Steindachner. A. (481)136.—**HYPOMESUS** Gill. (143)500. **Hypomesus pretiosus** Girard. C. (482)501. **Hypomesus olidus** Pallas. A. (483)137.—**ARGENTINA** Linnæus.502. **Argentina syrtensium** Goode & Bean. B. (484)138.—**HYPHALONEDRUS**<sup>4</sup> Goode. (145)503. **Hyphalonedrus chalybeins** Goode. B. (485)

increase in size backwards, and teeth on the palate enlarged, one on each side of the vomer and several on the palatines; moderate dorsals obliquely opposed, forked caudal and pectorals, each with a separate and specialized uppermost ray." ("Ταπηρ, above: χωριστος, split, in allusion to the division of the pectorals.)

The species *H. tanneri* Gill, from the Gulf Stream in deep water, has not been described.

<sup>1</sup> According to Dr. Bean, the so-called barbel at the throat in *Malacosteus niger* is a muscle apparently concerned in the movement of the mandible.

<sup>2</sup> The *Argentininae* may well be regarded as a family distinct from the *Salmonidae*, differing in the form of the stomach, as stated in the Synopsis.

<sup>3</sup> *Osmerus attenuatus* Lockington, an extremely doubtful species, is here omitted, as also the land-locked varieties of *O. mordax*.

<sup>4</sup>This genus perhaps belongs to the *Scopelidae*.

## Family XLIX.—SALMONIDÆ. (46)

## 139.—COREGONUS Linnæus. (146)

§ *Prosopium* Milner.

504. *Coregonus williamsoni* Girard. R. (487)  
 505. *Coregonus quadrilateralis* Richardson. Vn. (488)  
 506. *Coregonus kennicotti* Milner. Y. (489)  
 507. *Coregonus nelsoni*<sup>1</sup> Bean. Y.

§ *Coregonus*.

508. *Coregonus clupeiformis* Mitchell. Vn. (490)  
 509. *Coregonus labradoricus* Richardson. Vn. (491)

§ *Argyrosomus* Agassiz.

510. *Coregonus hoyi* Gill. Vn. (492)  
 511. *Coregonus merki* Günther. Y. (493)  
 512. *Coregonus laurettæ* Bean. Y. (493 b.)  
 513. *Coregonus artedi* Le Sueur. Vn. (494)  
 514. *Coregonus nigripinnis* Gill. Vn. (495)

§ *Allosomus* Jordan.

515. *Coregonus tullibee* Richardson. Vn. (496)

## 140.—THYMA LLUS Cuvier. (147)

516. *Thymallus signifer* Richardson. Y. Vn. (497)  
 516 b. *Thymallus signifer ontariensis*<sup>2</sup> Cuv. & Val. Vn. (497 b.)

141.—STENODUS<sup>3</sup> Richardson. (148)

517. *Stenodus mackenziei* Richardson. Y. Vn. (498)

## 142.—ONCORHYNCHUS Suckley. (149)

518. *Oncorhynchus gorbuscha* Walbaum. C. A. Ana. (499)

<sup>1</sup> *Coregonus nelsoni* Bean, Proc. U. S. Nat. Mus., 1884; waters of Alaska.

<sup>2</sup> *Thymallus ontariensis* Cuvier & Valenciennes, XXI, 452, 1848 (specimens sent by Milbert from Lake Ontario)=*Thymallus tricolor* Cope. The following is a translation of Valenciennes' account: We have received from Lake Ontario a *Thymallus* very near to that of the lake of Geneva. It has, however, more naked space under the throat, although less than in *Thymallus gymnothorax*. The head is evidently more pointed, the body more elongate, the dorsal a little longer. The denticulations of the scales are more pronounced. The colors seem scarcely to differ from those of *Thymallus*, for our specimens are greenish, with a dozen gray lines along the flanks. The dorsal has 4 or 5 longitudinal streaks of red. Our specimens are a foot long; they have been sent by M. Milbert. (Valenciennes l. c.)

<sup>3</sup> The original diagnosis of *Stenodus* is said to be in "Appendix Bach's Voyage. Rept. N. Am. Zoöl., 1836."

According to Dr. Bean, our species is probably not distinct from the Asiatic species, *S. leucichthys* (Guldenstadt).

519. *Oncorhynchus keta* Walbaum. C. A. Ana. (500)  
 520. *Oncorhynchus tchawytcha* Walbaum. C. A. Ana. (501)  
 521. *Oncorhynchus kisutch* Walbaum. C. A. Ana. (502)  
 522. *Oncorhynchus nerka* Walbaum. C. A. Ana. (503)

143.—**SALMO** Linnaeus. (150)§ *Salmo*.

523. *Salmo salar* L. N. Eu. Ana. (504)  
 523b *Salmo salar sebago* Girard. Vne.

§ *Salar*<sup>1</sup> Cuv. & Val.

524. *Salmo gairdneri* Richardson. C. A. (506)  
 524b *Salmo gairdneri irideus*<sup>2</sup> Ayres. T. (505)  
 525. *Salmo purpuratus* Pallas R. C. A. (508)  
 525b. *Salmo purpuratus bouvieri* Bendire. R.  
 525c. *Salmo purpuratus stomias* Cope. R.  
 525d. *Salmo purpuratus heushawi* Gill & Jordan. R.  
 525e. *Salmo purpuratus spilurus* Cope. R. (507)

144.—**SALVELINUS** Richardson. (151)§ *Cristivomer* Gill & Jordan.

526. *Salvelinus namaycush* Walbaum. Vn. (509)  
 526b *Salvelinus namaycush siscowet* Agassiz. Vn.

§ *Salvelinus*.

527. *Salvelinus oquassa*<sup>3</sup> Girard. Vne. (510, 511, 516?)  
 528. *Salvelinus arcturus* Giinther. Vne. (512)  
 529. *Salvelinus malma* Walbaum. Y. C. A. (513)  
 530. *Salvelinus fontinalis* Mitchell. Vne. (514, 515)  
 530b *Salvelinus fontinalis immaeulatus* H. R. Storer. N. Ana.  
 531. *Salvelinus stagnalis*<sup>4</sup> Fabricius. G. (517?, 518)

## Family L.—PERCOPSIDÆ.

145.—**PERCOPSIS** Agassiz. (152)

532. *Percopsis guttatus* Agassiz. Vn. (519)

<sup>1</sup> This subgenus is called *Fario* in the Synopsis, but the type of *Fario* is probably a genuine *Salmo*.

<sup>2</sup> *Salmo gairdneri* is probably the adult sea-run form of *Salmo irideus*.

<sup>3</sup> *Salvelinus rossi* may be omitted from the lists, as no diagnostic characters of importance occur in the description. It may be treated as a very doubtful synonym of *S. oquassa*. *S. naresi* agrees very closely with *S. oquassa*.

<sup>4</sup> *Salvelinus nitidus* may be omitted, as probably identical with *S. stagnalis*. For a description of this species see *Dresel*, Proc. U. S. Nat. Mus., 1884, 255.

Family LI.—STERNOPTYCHIDÆ.<sup>1</sup> (43)146.—ARGYROPELECUS<sup>2</sup> Cocco.533. *Argyropelecus hemigymnus* Cocco. O. Eu.534. *Argyropelecus olfersi* Cuvier. O. Eu.147.—STERNOPTYX<sup>3</sup> Hermann.535. *Sternoptyx diaphana* Hermann. O. Eu.

<sup>1</sup> A suborder *Inomi*, to include the *Sternoptychidae* and *Chauliodontidae*, has been proposed by Dr. Gill, Proc. U. S. Nat. Mus., 1884, 350. The chief respect in which these families differ from the other *Isospondyli* is in the mode of articulation of the scapular arches, which connect with and impinge on the occiput behind and are otherwise free from the cranium. (*Ivior*, nape; *ωμός*, shoulder.)

Dr. Günther and others have stated that the *Sternoptychidae* possess a "rudimentary spinous dorsal fin." This appearance is due to the projection of one or more of the neural spines beyond the muscles, and is in no proper sense a rudiment of a fin. (See Gill, l. c., 350.)

<sup>2</sup> ARGYROPELECUS Cocco.( *Pleurothyris* Lowe.)

(Cocco, Giorn. Sci. Sicil., 1829, fasc. 77, p. 146; type, *Argyropelecus hemigymnus* Cocco.)

Body much elevated and compressed, passing abruptly into the slender tail; no scales, the skin covered with silvery pigment: series of phosphorescent spots along the lower side of the head, body, and tail. Head large, compressed, and elevated, the bones thin but ossified. Cleft of mouth wide, vertical, the lower jaw prominent. Margin of upper jaw formed by the maxillary and premaxillary, both of which have a sharp edge, which is beset with minute teeth: lower jaw and palatine bones with a series of small curved teeth. Eyes large, very close together, lateral, but directed upwards. Angle of preopercle with a spine usually directed downwards. Pectorals well developed; ventrals very small. Humeral arch and pubic bones prolonged into flat pointed processes, which project in the median line of the belly; a series of imbricated scales from the humeral bone to the pubic spine, forming a ventral serrature. Dorsal fin short, median, preceded by a serrated osseous ridge, consisting of several neural spines prolonged beyond the muscles. Adipose fin rudimentary; anal fin short: caudal forked. Gill opening very short, the outer branchial arch extending forward to behind the synphysis of the lower jaw, and beset with very long gill rakers; branchiostegals nine; pseudobranchiae and air-bladder present. Four pyloric cæca. Small pelagic fishes. (*Ιρυνρος*, silvery; *πελεκης*, hatchet.)

*Argyropelecanus hemigymnus* Cocco. Depth of body equal to distance between gill-openings and base of caudal; posterior corner of mandible and angle of preopercle each with a small triangular spine; tail without spines; pectoral fin nearly reaching anal. B. 9, D. 7 or 8, A. 11, P. 9, V. 5, L. 2 inches, (Günther). Atlantic and Mediterranean in deep water; not rare in the Gulf Stream off Southern New England.

(Cocco, l. c., Cuv. & Val. XXII, 398; Günther, V, 385; Goode & Bean, Bull. Mus. Comp. Zoöl., 1882, 220.)

*Argyropelecus olfersi* (Cuvier) C. & V. Depth nearly or quite equal to distance from shoulder to root of caudal; tail as deep at base as long. Mandible with a short flat spine at its posterior corner; preopercular spine directed downwards; tail without spines; pectoral fin reaching ventrals. B. 9, D. 9, A. 11, P. 10, V. 6 (Günther). Coast of Norway, lately taken in the Gulf Stream, off Southern New England.

(*Sternoptyx olfersi* Cuvier, Règne Animal., ed. 2d, II, 316; Cuv. & Val. XXII, 408; Günther, V, 386; *Pleurothyris olfersi* Lowe, Fish. Madeira, 64.)

<sup>3</sup> STERNOPTYX Hermann.(Hermann, Naturforscher, 1771, XVI, 8; type *Sternoptyx diaphana* Hermann.)

Trunk much elevated and compressed, the slender tail very short; abdominal out-

## Family LII.—CHAULIODONTIDÆ. (44)

148.—**CHAULIODUS** Bloch & Schneider. (133)536. **Chauliodus sloani** Bloch & Schneider. B. Ev. (469)149.—**CYCLOTHONE**<sup>1</sup> Goode & Bean.537. **Cyclothona lusca** Goode & Bean. B.150.—**SIGMOPS**<sup>2</sup> Gill.538. **Sigmops stigmaticus** Gill. B.

line nearly continuous, in a sigmoid curve; teeth of the jaws in several series, the largest teeth in the inner row; a single spike-like neural spine before dorsal; branchiostegals, 5. Otherwise essentially as in *Argyropelecus*. ( $\Sigma\tau\epsilon\rho\nu\sigma\nu$ , breast;  $\pi\tau\nu\xi$ , fold or plait.)

*Sternopyx diaphana* Hermann.

Depth equal to distance between tip of snout and base of the very short tail. Interorbital space slightly concave; posterior limb of preopercle bordering hind part of orbit, and descending very obliquely, ending in two points. Pectoral scarcely reaching ventrals, which are very small. B. 5, D. 9, A. 13, P. 10, V. 3. (Günther.) Atlantic; lately taken in the Gulf Stream, about lat. 33°.

(Hermann, l. c.; Günther, V, 387; Goode &amp; Bean, Bull. Mus. Comp. Zoöl., 1882, 220.)

<sup>1</sup> **CYCLOTHONE** Goode & Bean.(Goode & Bean, Bull. Mus. Comp. Zoöl., 1882, 221; type *Cyclothona lusca* G. & B.)

Body elongate, somewhat compressed (apparently covered with rather large, thin, very caducous scales); lower parts with a series of luminous spots. Head conical; cleft of mouth very wide, oblique extending behind eye, the lower jaw strongly projecting. Maxillary long and slender, sickle-shaped, closely connected with the short premaxillary. Upper jaw with a single series of rather large close-set sharp teeth, about every fourth one slightly longer than the rest, and directed slightly outward. Lower jaw with similar teeth, subequal, directed forward, with a few canines in front. A small patch of minute teeth on vomer; palatines smooth. Eye small, inconspicuous. Gill openings very wide, the membranes free from the isthmus. Gill rakers numerous, long and slender. Pseudobranchiae none. Branchiostegals (apparently 7 to 9). No air-bladder. Dorsal and anal well developed, opposite each other. No adipose fin. Caudal forked, its peduncle long and slender. Deep-sea fishes of small size, closely related to the European genus *Gonostoma*. ( $\kappa\kappa\lambda\omega\varsigma$ , round;  $\omega\vartheta\omega\eta\eta$ , veil.)

*Cyclothona lusca* Goode & Bean.

Uniform black, the mucous pores inconspicuous. Maxillary extending backward to a distance from tip of snout equal to length of head without snout; eye as long as snout, 7 in head. Distance from snout to dorsal three times length of lower jaw, its base as long as head. Second ray longest,  $\frac{1}{2}$  base of fin. Insertion of anal under second ray of dorsal, its longest rays a little higher than those of dorsal. Pectoral,  $7\frac{1}{2}$  in length of body. Distance from snout to ventral twice head; ventral 7 in body. Head, 4 $\frac{1}{2}$ ; depth, 7 $\frac{1}{2}$ . D. 1, 11, A. 1, 16, P. 10, V. 5. Gulf Stream, in deep water off south coast of New England, not rare.

(Goode &amp; Bean, Bull. Mus. Comp. Zoöl. 1882, 221.)

<sup>2</sup> **SIGMOPS** Gill.(Gill, Proc. U. S. Nat. Mus., 1883, 256; type *Sigmops stigmaticus* Gill.)

No scales or pseudobranchiae; body elongate, claviform; dorsal short; anal long, the insertions of the two fins opposite each other; teeth moderately elongate, alter-

## ORDER P.—HAPLOMI. (N)

## Family LIII.—AMBLYOPSIDÆ. (48)

151.—**AMBLYOPSIS** De Kay. (153)539. *Amblyopsis spelæus* De Kay. Vw. (520)152.—**TYPHЛИCHTHYS** Girard. (154)540. *Typhlichthys subterraneus* Girard. Vw. (521)153.—**CHOLOGASTER** Agassiz. (155)541. *Chologaster cornutus* Agassiz. Vse. (522)542. *Chologaster agassizii* Putnam. Vw. (523)543. *Chologaster papillifer* Forbes. Vw. (523b.)

## Family LIV.—CYPRINODONTIDÆ. (49)

154.—**JORDANELLA** Goode & Bean. (156)544. *Jordanella floridæ* Goode & Bean. Vw. (524)155.—**CYPRINODON** Lacépède. (157)545. *Cyprinodon variegatus* Lacépède. N. S. (525)545b. *Cyprinodon variegatus gibbosus* Girard. S. (526)546. *Cyprinodon riverendi*<sup>1</sup> Poey. W.547. *Cyprinodon bovinus*<sup>2</sup> Girard. Vsw. (526)548. *Cyprinodon eximus*<sup>2</sup> Girard. Vsw. (526b.)549. *Cyprinodon latifasciatus* Garman. Vsw. (527)550. *Cyprinodon elegans* Baird & Girard. Vsw. (528)551. *Cyprinodon californiensis* Girard. C? (529)552. *Cyprinodon macularius* Girard. R. (530)553. *Cyprinodon mydrus*<sup>3</sup> Goode & Bean. S. W.554. *Cyprinodon carpio* Günther. (531)

nating with short ones, in a row on the maxillaries as well as premaxillaries and mandible. Deep-sea fishes. ( $\Sigma\gamma\mu\alpha$ , S;  $o\psi$ , eye.)

*Sigmops stigmaticus* Gill.

"Its distinct inferior pearly spots, arranged in two rows on each side of the abdomen, are well marked, and the upper have wax-like guttiform spots connected with them below; there is also a broad longitudinal silvery band or sheen." Gulf Stream, lat. 38, at 2,361 fathoms.

(Gill, Proc. U. S. Nat. Mus., 1882, 256.)

<sup>1</sup> *Cyprinodon riverendi* Poey; *Trifarcus riverendi* Poey, Memorias Cuba, II, 306, 1860; *Cyprinodon riverendi* Jordan, Proc. U. S. Nat. Mus., 1884, 109; Key West to Cuba. Very closely related to *C. gibbosus*, but with larger scales (24-12), smaller head and the anal edged with black. The genus *Trifarcus* Poey, of which this species is the type, is founded on the erroneous statement of Valenciennes that *Cyprinodon variegatus* has but five branchiostegals.

<sup>2</sup> A doubtful species, unknown to me.

<sup>3</sup> *Cyprinodon mydrus* Goode & Bean, Proc. U. S. Nat. Mus., 1882, 433; Jordan and Gilbert, Proc. U. S. Nat. Mus., 1884, 110; Pensacola to Key West. A strongly marked and handsome species, possibly identical with *C. carpio*.

156.—**CHARACODON**<sup>1</sup> Günther.555. **Characodon furcidens** Jordan & Gilbert. P.157.—**ADINIA** Girard.556. **Adinia multifasciata**<sup>2</sup> Girard. S. (545b.)158.—**FUNDULUS** Lacépède. (158)§ *Hydrargyra*.557. **Fundulus majalis**<sup>3</sup> Walbaum. N. (532)558. **Fundulus similis** Baird & Girard. S. (534)559. **Fundulus parvipinnis** Girard. C. P. (536)§ *Fundulus*.560. **Fundulus zebrinus**<sup>4</sup> Jordan & Gilbert. Vsw. (536)<sup>1</sup> CHARACODON Günther.(Günther, Cat. Fish. Brit. Mus., VI, 1866, 308; type *Characodon lateralis* Günther.)

This genus differs from *Cyprinodon*, chiefly in the presence of a small band of villiform teeth behind the incisors. The incisors are bicuspid or V-shaped, and the vertical fins are longer than in *Cyprinodon*; fresh waters of Mexico and Central America; two species known. (Xáραξ, a sharp stake; ὀδων, tooth.) *Characodon furcidens* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 354; streams tributary to the Gulf of California, and southward; abundant.

<sup>2</sup> The group *Adinia*, defined on page 891 in the Synopsis, may be recognized as a distinct genus, intermediate between *Cyprinodon* and *Fundulus*, having the form of body and restricted gill openings of the former and the dentition of the latter. The single species (*Fundulus xenicus* Jor. & Gilb.) may stand as *Adinia multifasciata*.

<sup>3</sup> *Fundulus strimpina*, a doubtful species probably based on a confusion of several species, is here omitted.

<sup>4</sup> *Fundulus zebrinus* is thus redescribed by Professor Gilbert (Bull. Washburn Lab. Nat. Hist., 1, 1884, 15), from specimens taken at Ellis, Kans.:

"Head and body shaped much as in *Fundulus similis*, but the snout somewhat less elongate. Width of preorbital about  $6\frac{1}{2}$  in length of head; eye moderate, 4 to  $4\frac{1}{2}$  in head,  $1\frac{1}{2}$  in interorbital width; posterior margin of orbit in middle of length of head; teeth in both jaws in a villiform band, with the external series much enlarged; interorbital width  $2\frac{2}{3}$  in head; snout  $3\frac{1}{4}$ .

"Branchiostegals 5.

"Dorsal fin long and rather low, the base longer and the rays higher in males than in females; origin of dorsal nearly equidistant between snout and margin of caudal, slightly nearer the snout in males, and nearer end of caudal in females; base of dorsal in males 6 to  $6\frac{1}{2}$  in total length, the highest dorsal ray about half head; in females the base is  $7\frac{1}{2}$  in total length. Origin of anal opposite that of dorsal in males, behind it in females; in the latter the anal is sharply angulated, the anterior rays more than thrice the height of the posterior, and more than two-thirds length of head. In males the margins of both dorsal and anal fins are evenly rounded, the anal is the highest, its rays beset with minute white prickles. Oviduct forming a low sheath along base of anterior half of anal. Pectorals not reaching base of ventrals, equaling distance from snout to preopercular margin. Ventrals about reaching vent. Caudal truncate,  $1\frac{1}{2}$  in head.

"Scales very small, in about 60 oblique series from opercle to base of caudal; about 21 in an oblique series from vent upwards to middle of back; no enlarged humeral scale. In males the margins of scales are rough with minute tubercles.

"Head  $3\frac{1}{2}$  to  $3\frac{3}{4}$  in length; depth  $4\frac{1}{2}$  to  $4\frac{3}{4}$ . D. 14 or 15; A. 13 or 14. L. 3 inches.

"Color: Greenish above, sides and below silvery-white, the sides tinged with sul-

561. *Fundulus seminolis*<sup>1</sup> Girard. Vsw. (537)  
 562. *Fundulus extensus*,<sup>2</sup> Jordan & Gilbert. P.  
 563. *Fundulus diaphanus*<sup>3</sup> Le Sueur. Vn. N. (538, 540)  
 564. *Fundulus confluentus* Goode & Bean. S. (539)  
 565. *Fundulus adinia* Jordan & Gilbert. Vsw. (541)  
 566. *Fundulus heteroclitus*<sup>4</sup> Linnaeus. N. S. (543)  
 566b. *Fundulus heteroclitus grandis* Baird & Girard. S. (543 b.)  
 567. *Fundulus ocellaris* Jordan & Gilbert. S. (542 b.)  
 568. *Fundulus vinctus*<sup>5</sup> Jordan & Gilbert. P.  
     § *Xenisma* Jordan.  
 569. *Fundulus catenatus* Storer. Vs. (544)  
 570. *Fundulus stellifer* Jordan. Vs. (545)

159.—**ZYGONECTES** Agassiz. (159)

571. *Zygonectes rubrifrons* Jordan. Vse. (546)  
 572. *Zygonectes henshalli* Jordan. Vse. (547)  
 573. *Zygonectes floripinnis* Cope. R. (548)  
 574. *Zygonectes lineatus* Garman. R. (549).  
 575. *Zygonectes sciadicus* Cope. Vnw. (555)  
 576. *Zygonectes notatus* Rafinesque. Vw. (550)  
 577. *Zygonectes dispar* Agassiz. Vw. (553)  
 578. *Zygonectes craticula* Goode & Bean. Vse. (553 b.)  
 579. *Zygonectes zonifer*<sup>6</sup> Jordan & Meek. Vse.  
 580. *Zygonectes chrysotus*<sup>7</sup> Günther. Vse. (556, 557)  
 581. *Zygonectes luciae*<sup>8</sup> Baird. Ve. (558)

160.—**LUCANIA** Girard. (160)

582. *Lucania venusta* Girard. S. (559)  
 583. *Lucania parva* Baird & Girard. N. S. (560)  
 584. *Lucania goodei* Jordan. S. (561)

plur-yellow; the greater part of each scale on back rendered dusky by black points; sides with from 14 to 18 dusky bars from back to ventral region, occasionally meeting on ventral line; these bars are very variable in width, seemingly narrower in females, in which half-bars are frequently inserted between the others; the interspaces are as wide as the bars, or usually wider. Fins yellowish, without distinct markings, in the males all very dusky except the anal."

<sup>1</sup> This species is redescribed by Jordan (Proc. U. S. Nat. Mus., 1884, 322).

<sup>2</sup> *Fundulus extensus* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 355. Cape San Lucas.

<sup>3</sup> *Fundulus menona* appears to be identical with *F. diaphanus*.

<sup>4</sup> *Fundulus nigrofasciatus* seems to be the young of *Fundulus heteroclitus*.

<sup>5</sup> *Fundulus vinctus* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 355. Cape San Lucas.

<sup>6</sup> *Zygonectes zonifer* Jordan & Meek, Proc. U. S. Nat. Mus., 1884. Allamaha R., Ga.

<sup>7</sup> ? *Fundulus cingulatus* Cuv. & Val. = *Haplochilus chrysotus* Günther = *Fundulus zonatus* C. & V., not *Esox zonatus* Mitchell, which is a young *Fundulus*. For descriptions of this species see Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 586, and Jordan, op. cit., 1884, 320. It is best to use the name of *chrysotus* for this species, as *cingulatus* cannot be positively identified, and *zonatus* was originally given to some other fish.

<sup>8</sup> The description of *Zygonectes cingulatus* given in the Synopsis (p. 342) belongs to this species. It is probably distinct from *Z. chrysotus*, as the latter has no dorsal ocellus in either sex.

161.—**GAMBUSIA** Poey. (161)

585. **Gambusia patruelis**<sup>1</sup> Baird & Girard. Vs. (551, 552, 562)  
 586. **Gambusia humilis**<sup>2</sup> Günther. Vsw. (554, 463)  
 587. **Gambusia arlingtonia**<sup>3</sup> Goode & Bean. Vse. (564)  
 588. **Gambusia affinis**<sup>3</sup> Baird & Girard. Vsw. (565)  
 589. **Gambusia nobilis**<sup>3</sup> Baird & Girard. Vsw. (566)  
 590. **Gambusia senilis**<sup>3</sup> Girard. Vsw. (566 b.)

162.—**MOLLIENESIA** Le Sueur. (162)

591. **Mollienesia latipinna**<sup>4</sup> Le Sueur. S. (567, 567 b.)

163.—**PŒCILIA** Bloch & Schneider. (163)

592. **Pœcilia couchiana** Girard. Vsw. (568)

164.—**HETERANDRIA**<sup>5</sup> Agassiz. (164)

593. **Heterandria formosa** Agassiz. Vse. (164)  
 594. **Heterandria occidentalis** Baird & Girard. R. (570)  
 595. **Heterandria ommata**<sup>6</sup> Jordan. Vse.

Family LV.—**UMBRIDÆ.** (50)165.—**UMBRA** Müller. (169)

596. **Umbra limi** Kirtland. Vnw. (571)  
 596 b. *Umbra limi pygmæa* DeKay. Ve.

Family LVI.—**ESOCIDÆ.** (51)166.—**ESOX** Linnaeus. (167)

§ *Picorellus* Rafinesque.

597. **Esox americanus** Gmelin. Ve. (573)  
 598. **Esox vermiculatus** Le Sueur. Vw. (574)  
 599. **Esox reticulatus**<sup>7</sup> Le Sueur. Ve. (575)

<sup>1</sup> *Zygonectes atrilatus*, *Zygonectes inurus*, *Haplochilus melanops*, *Gambusia holbrookii*, and probably *Gambusia arlingtonia* also, are identical with *Gambusia patruelis*.

<sup>2</sup> *Gambusia humilis* Günther—*Zygonectes brachypterus* Cope, seems to be distinct from *Gambusia patruelis*. It abounds in the streams of Texas, and may be known at once from *G. patruelis* by the absence of the black suborbital spot.

<sup>3</sup> Doubtful species, unknown to me.

<sup>4</sup> *Mollienesia lineolata* is identical with *M. latipinna*.

<sup>5</sup> The name *Heterandria* Agassiz, Amer. Journ. Sci. Arts., 1853, as now restricted is identical with *Girardinus*, and must supersede this later name. The type is *Heterandria formosa* Agassiz. As originally defined, both *Gambusia* and *Girardinus* were included in *Heterandria*. See Jordan & Meek, Proc. U. S. Nat. Mus., 1884, 236.

<sup>6</sup> *Heterandria ommata* Jordan, Proc. U. S. Nat. Mus., 1884, 323. Indian R., Florida.

<sup>7</sup> This species should stand as *Esox vermiculatus*, instead of *Esox salmonneus* or *Esox umbrosus*.

To the synonymy add:

(*Esox vermiculatus*, *Esox lineatus*, and ? *Esox lugubrosus* Le Sueur MSS. in Cuv. & Val., XVIII, 333, 335, 338, 1846.)

§ *Esox*.600. *Esox lucius* Linnaeus. Eu. Vn. (576)§ *Mascalongus* Jordan.601. *Esox nobilior* Thompson. Vn. (577)ORDER Q.—XENOMI.<sup>1</sup>

## Family LVII.—DALLIIDÆ.

167.—*Dallia* Bean. (166)602. *Dallia pectoralis* Bean. Y. (572)ORDER R.—COLOCEPHALI.<sup>2</sup>

## Family LVIII.—MURÆNIDÆ. (52.)

168.—*MURÆNOBLENNIA*<sup>3</sup> Lacépède.603. *Murænoblenna nectura* Jordan & Gilbert. P.169.—*MURÆNA* Linnaeus. (168)604. *Muræna retifera* Goode & Bean. S. (578)605. *Muræna pinta*<sup>4</sup> Jordan & Gilbert. P.170.—*Sidera* Kaup.606. *Sidera castanea*<sup>5</sup> Jordan & Gilbert. P.607. *Sidera mordax* Ayres. C. (579)608. *Sidera dovii*<sup>6</sup> Günther. P.609. *Sidera ocellata* Agassiz. S. (580)

<sup>1</sup>The genus *Dallia*, although agreeing in many external characters with *Umbra*, has very little affinity with that group or any other of our fishes. Its skeleton is so peculiar in structure that it has been taken by Dr. Gill as the representative of a peculiar order or suborder, *Xenomi*, which is thus defined:

"Teleosts with the scapular arch free from the cranium laterally and only abutting on it behind, coracoids represented by a simple cartilaginous plate without developed actinosts, and with the intermaxillary and supramaxillary bones coalescent." ( $\Xi\acute{\epsilon}\nu\sigma\varsigma$ , strange;  $\omega\mu\sigma\varsigma$ , shoulder.)

<sup>2</sup>Order *Colocephali* Cope, Trans. Am. Philos. Soc., 1871, 456 (includes the *Murænidæ*).

<sup>3</sup>*MURÆNOBLENNIA* Lacépède.

(*Gymnomuræna* Günther, not of Lacépède, as restricted by Kaup.)

(Lacépède, His. Nat. Poiss., V, 652, 1803; type *Muranoblenna olivacea* Lacépède.)

This genus differs from *Muræna* chiefly in the reduction of the fins to a short fold, surrounding the tail. Posterior nostrils not tubular. Gape, moderate. Tropical seas. ( $Mυραίνα$ , eel;  $\beta\lambdaεννα$ , slime. "Blenna en grec, signifié mucosité." Lacépède.) *Murænoblenna nectura* = *Gymnomuræna nectura* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 356. Cape San Lucas.

<sup>4</sup>*Muræna pinta* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1881, 345. Gulf of California and southward.

<sup>5</sup>*Sidera castanea* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1883, 208. Mazatlan and southward. In this paper is an analysis of the characters of the species of *Sidera* found on the Pacific coast of America.

<sup>6</sup>*Muræna dovii* Günther, VIII, 103, 1870; = *Muræna pintita* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1881, 346; 1883, 209. Mazatlan to Galapagos Islands.

610. *Sidera funebris*<sup>1</sup> Ranzani. P. (580 b.)

611. *Sidera moringa* Cuvier. P. (580 c.)

## ORDER S.—ENCHELYCEPHALL.<sup>2</sup> (0.)

### Family LIX.—CONGRIDÆ.<sup>3</sup> (53 part.)

#### 171.—ICHTHYAPUS<sup>4</sup> Barneville.

612. *Ichthyapus selachops* Jordan & Gilbert. P.

#### 172.—LETHARCHUS Goode & Bean. (168 b.)

613. *Letharchus velifer* (Goode & Bean. S. (580 b.)

#### 173.—CALLECHELYS<sup>5</sup> Kaup. (169)

614. *Callechelys scuticaris* Goode & Bean. S. (581)

615. *Callechelys teres* Goode & Bean. S. (581 b.)

616. *Callechelys bascanium*<sup>6</sup> Jordan. W.

<sup>1</sup>The species called in the Synopsis (p. 895) *Murana afra* should stand as *Murana* or *Sidera funebris*.

In life this species is bright yellowish green, with some oblique dark streaks on the fins. It reaches a very large size and is much dreaded by fishermen. To its synonymy add: *Gymnothorax funebris* Ranzani, Nov. Comm. Ac. Sci. Inst. Bonon., IV, 1840, 76; *Murana lincopinus* Richardson, Voy. Erebus & Terror, 1844, 89; *Murana infernalis* Poey, Memorias Cuba, II, 347, 1861; *Murana afra* Günther, IX, 123; apparently not *Gymnothorax afer*, Bloch, Ausl. Fische, 1797, IX, 85, tab. 417, a fish from Guinea, described as being brown, marbled, and banded with white. The present species is always unicolor, green in life, and brown in spirits.)

<sup>2</sup>*Enchelycephali* Cope, Trans. Am. Philos. Soc., 1871, 455.

<sup>3</sup>The family of *Anguillidae*, as given in the text, is not a natural one. For the present we may subtract the aberrant genera *Anguilla* and *Simenchelys*, leaving the remaining genera in one group, *Congridæ*.

#### <sup>4</sup> ICHTHYAPUS Barneville.

(*Ophisuraphis* Kaup; *Apterichthys* Duméril.)

(Barneville, Revue Zoologique, 1847, 219; type *Ichthyapus acutirostris* Barneville.)

This genus differs from *Ophichthys* chiefly in the entire absence of fins. The snout projects beyond the small mouth, giving a shark-like physiognomy, and the teeth are small, mostly uniserial. (*Iχθύς*, fish; *απούς*, without feet.) *Ichthyapus selachops* = *Apterichthys selachops* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 356. Cape San Lucas.

<sup>5</sup>*Callechelys* Kaup (see Synopsis, p. 897), is distinguished from *Cæcula* by the development of the dorsal fin, which begins on the head. In *Cæcula* (*Sphagebranchus*), it begins behind the gill opening.

<sup>6</sup>*Callechelys bascanium* Jordan.

Dark brown, nearly uniform; fins a little paler. Body extremely slender, subterete, its greatest depth little more than two-fifths length of head; head short; snout 7 in head; mouth very small, the lower jaw thin, included, not extending to the anterior nostril, which is in a short tube; teeth short, subconic, bluntnish, a little unequal, their points directed backwards; lower teeth nearly uniserial; upper teeth uniserial laterally, partly biserial anteriorly; vomerine teeth forming a rhombic patch. Eye moderate, its length more than half that of snout, its center nearly over middle of upper jaw; cleft of mouth  $3\frac{1}{2}$  in length of head. Gill openings vertical, about as wide as isthmus; its upper edge on level of upper base of pectoral; pectoral developed, small, a little broader than long, nearly as long as snout; dorsal fin very low, beginning at a point midway between front of eye and gill opening; anal similar to dorsal.

174.—**Ophisurus**<sup>1</sup> Lacépède. (170 b.)

617. *Ophisurus acuminatus*<sup>2</sup> Gronow. W. (584 b.)  
 618. *Ophisurus xysturus*<sup>3</sup> Jordan & Gilbert. P.

175.—**Ophichthys**<sup>4</sup> Ahl. (170)

619. *Ophichthys miurus*<sup>4</sup> Jordan & Gilbert. P.  
 620. *Ophichthys triserialis* Kaup. C. P. (583)  
 621. *Ophichthys ocellatus* Le Sueur. P. (584)  
 622. *Ophichthys guttifer*<sup>5</sup> Bean & Dresel. W.  
 623. *Ophichthys macrurus* Poey. W. (583 b.)  
 624. *Ophichthys chrysops* Poey. W. (583 c)  
 625. *Ophichthys zophochir*<sup>6</sup> Jordan & Gilbert. P.  
 626. *Ophichthys schneideri*<sup>7</sup> Steindachner. W. (582)  
 627. *Ophichthys intertinctus*<sup>8</sup> Richardson. W.

Head  $1\frac{1}{2}$  in distance from top of snout to vent; head and trunk a little longer than tail. Length of type, 31 inches; head,  $1\frac{2}{3}$ ; trunk,  $14\frac{2}{3}$ . Egmont Key, Florida; distinguished from *C. teres* by the very short head.

(*Cacula bascanium* Jordan, Proc. Ac. Nat. Sci., Phila., 1884, 43.)

<sup>1</sup> For a discussion of the correct application of the names *Ophichthys*, *Ophisurus*, and *Cacula* see Jordan & Gilbert, Proc. U. S. Nat. Mus., 1884, 648.

<sup>2</sup> As stated in the Synopsis, p. 974, the name *acuminatus* should supersede *longus* for this species.

<sup>3</sup> *Ophichthys xysturus* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1881, 346. Mazatlan to Panama.

<sup>4</sup> *Ophichthys miurus* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 357. Cape San Lucas.

<sup>5</sup> *Ophichthys guttifer* Bean & Dresel.

Allied to *O. ocellatus* Le Sueur. Greatest depth equal to distance from angle of mouth to tip of snout. Dorsal fin beginning at a distance behind vertical from tip of pectoral equal to length of snout. Pectoral nearly  $3\frac{1}{2}$  in head; head 8 in total length,  $2\frac{2}{3}$  in trunk. Eye  $1\frac{1}{2}$  in snout; 9 in head. Twenty-one or 22 small white spots along median line. Gulf of Mexico. (Bean & Dresel, Proc. Biol. Soc., Washington, II, 1884, 99.)

<sup>6</sup> *Ophichthys zophochir* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1881, 347. Mazatlan.

<sup>7</sup> The specimens which we have referred to *Ophichthys punctifer* (*mordax*) belong rather to *Ophichthys schneideri* Steindachner.

Yellowish brown; head with small dark brown elongate spots; sides with about three rows of rather large oval spots, the lower disappearing behind the vent, number of rows becoming greater anteriorly; broad half spots along upper margin of dorsal, and bordered with blackish. Head  $3\frac{1}{2}$  in trunk; snout conical, blunt anteriorly. Cleft of mouth very long, 2 in head; eye 11; snout 7. Teeth in both jaws in two rows, those of the outer row in both very sharp, unequal, some of them quite long, those of the inner row smaller and subequal; vomerine teeth rather small, in two rows, diverging forward; one or two long canines in front, behind the two series of the upper jaw. Both nostrils with short tubes. Pectoral 4 in head; dorsal beginning about  $1\frac{1}{2}$  eye's diameters behind the point of the pectoral. Tail longer than the rest of the body by  $1\frac{1}{2}$  head's lengths. (Steindachner.) West Indies, occasionally taken from the stomachs of Red Snappers at Pensacola. Apparently distinct from *O. punctifer* (= *O. mordax*), having the vomerine teeth in two rows instead of three.

*Crotalopsis mordax* Goode & Bean, Proc. U. S. Nat. Mus., 1879, 154; not *Macrodonophis mordax* Poey; Steindachner, Ichth. Beitr., VIII, 67, 1879; Jordan & Gilbert, Proc. U. S. Nat. Mus., 1883, 143.)

<sup>8</sup> *Ophichthys intertinctus*.

Dark brown above, paler below; sides and back with about three rows of large ovate brown spots, somewhat irregular in size and position, those of the upper row smallest, the large and small ones of the lower rows somewhat alternating. Spots on head small and numerous. Dorsal with an interrupted dark margin; anal with

176.—**MYRICHTHYS** Girard. (171)628. **Myrichthys tigrinus** Girard. C. (585)177.—**MYROPHIS** Lütken. (171 b.)629. **Myrophis lumbricus** Jordan & Gilbert. S. (585 b.)630. **Myrophis punctatus**<sup>1</sup> Lütken. W. (585 c.)631. **Myrophis vafer**<sup>2</sup> Jordan & Gilbert. P.632. **Myrophis egmontis**<sup>3</sup> Jordan. W.178.—**NEOCONGER** Girard. (172)633. **Neoconger mucronatus** Girard. W. (586)179.—**NETTASTOMA**<sup>4</sup> Rafinesque.634. **Nettastoma procerum** Goode & Bean. B.

a darker edge; pectorals blackish. Gill openings wide, the isthmus rather narrow; head  $3\frac{1}{2}$  in trunk. Cleft of mouth very wide, nearly half length of head. Teeth sharply pointed, with a few large fixed canines in both jaws, and one or two larger ones in front of upper jaw; about 4 moderate canines near front of lower jaw; teeth in both jaws in double series, those of the inner series in the upper jaw depressible. Vomer with a double series confluent behind. Eye small,  $1\frac{1}{2}$  in snout, which is about  $6\frac{1}{2}$  in head. Pectoral about 5 in head. Dorsal commencing a little behind end of pectoral. Tail rather longer than rest of body. West Indies, north to Egmont Key, Florida.

(*Ophisurus intertinctus* Richardson, Ereb. & Terr. Fish., 102; *Echiopsis intertinctus* Kaup, Apodes, 13, 1858; Günther, VIII, 57; *Ophichthys intertinctus* Jordan, Proc. Ac. Nat. Sci. Phila., 1884, 43.)

<sup>1</sup> *Myrophis punctatus* Lütken = *Myrophis microstigmus* Poey. To the synonymy, add— (Lütken, Vid. Med. Naturh. Foren. Kjobenh., 1851, 1; *Myrophis longicollis* Kaup, Apodes, 30, 1858; Jordan, Proc. Ac. Nat. Sci. Phila., 1883, 282; not of Günther, VIII, 51, = *M. vafer* Jor. & Gilb.)

<sup>2</sup> *Myrophis vafer* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 645. Guaymas to Panama.

<sup>3</sup> *Myrophis egmontis* Jordan.

Dark brown, apparently uniform, somewhat paler below; head small, slender, moderately pointed; anterior nostril in a short tube; posterior, large, labial directly behind it; cleft of mouth rather short, extending to beyond the rather large eye, which is more than half the length of the snout; cleft of mouth,  $3\frac{1}{2}$  in head; teeth on both jaws subequal, pointed, slightly compressed, arranged in single series, those of both jaws directed somewhat backward; the lower teeth larger and more oblique than the upper; about four small fixed canines in front of upper jaw; no teeth on vomer in two specimens examined; tongue not free; lower jaw considerably shorter than upper, its edge considerably curved, concave in outline. Nape somewhat elevated; top of head with large pores. Head  $5\frac{1}{2}$  in distance from snout to vent; head and trunk a little shorter than tail; body slender, its greatest depth a little more than length of gape. Pectoral short and broad, slightly longer than snout; the gill opening short, oblique, extending downward and backward from near the middle of the base of the pectoral. Dorsal fin beginning behind vent, at a distance about equal to length of gape; the fin very low in front, becoming gradually higher towards the tip of tail; anal low, but well developed, considerably higher than dorsal, highest anteriorly, uniting with the dorsal around the tail. Length, 15 inches. Egmont Key, Florida.

(Jordan, Proc. Ac. Nat. Sci. Phila., 1884, 44.)

<sup>4</sup> **NETTASTOMA** Rafinesque.

(*Hyoprurus* Kölliker; larva.)

Rafinesque, Caratteri di Alcuni Nuovi Generi, &c., 1810, 66; type *Nettastoma melanura* Raf.)

Scaleless. Tail tapering into a point. Snout much produced, depressed; jaws and

180.—**MURÆNESOX**<sup>1</sup> McClelland.635. *Murænesox coniceps* Jordan & Gilbert. P.181.—**CONGER**<sup>2</sup> Cuvier. (174)636. *Conger conger* Linnaeus. N. S. W. Eu. P. (588)637. *Conger caudicula* Bean. W. (588 b.)

## Family LX.—ANGUILLIDÆ.

182.—**ANGUILLA**<sup>3</sup> Thunberg. (173)638. *Anguilla anguilla rostrata* De Kay. V. N. S. W. (587)

vomer with bands of cardiform teeth, those along the median line of the vomer being somewhat the larger. Vertical fins well developed, the dorsal commencing behind gill opening; no pectorals. Gill openings moderate. Nostrils on upper surface of head, valvular, the anterior near end of snout, the posterior above anterior angle of eye. Air bladder present. (*Nerræ*, duck; *cróua*, mouth.)

*Nettastoma procerum* Goode & Bean.

Body extremely elongate, compressed, especially so posteriorly, the tail tapering to a very attenuate point. Head slender, conical, the jaws somewhat depressed, the upper heavier and thicker, projecting beyond the lower a distance equal to the diameter of the eye. Numerous pores on both jaws and on the nape. Snout with a slender filamentous tip, twice as long as the eye. Teeth arranged as in *N. melanurum*, but excessively small. Dorsal commencing above gill opening. Insertion of anal at a distance from snout equal to  $3\frac{2}{3}$  times length of head. Tail twice as long as head and body. Lateral line well developed, in a deep furrow. Height of dorsal and anal about half depth of body, brownish; peritoneum black. (Gulf Stream, in deep water, at about lat.  $34^{\circ}$ . (Goode & Bean.)

(Goode & Bean, Bull. Mus. Comp. Zoöl., 1883, 224.)

<sup>1</sup> **MURÆNESOX** McClelland.

(*Cynoponticus* Costa.)

Form of *Conger*: Body scaleless; snout long; posterior nostrils opposite upper part of eye; tongue not free; jaws with several series of small, close-set teeth, with canines in front; vomer with several series of strong teeth, those of the median series enlarged and usually compressed; gill openings wide; pectorals well developed; dorsal beginning above the gill opening, continuous with the anal around the tail. Large eels of the tropical seas.

*Murænesox coniceps* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1881, 348. Mazatlan to Panama.

The name *Conger* should probably be retained for this genus. It does not appear to be entirely certain that *Leptocephalus morrisi* is a larval Conger. *Echelus* Rafinesque (1810) is based in part on Congers, but most of the numerous typical species remain unidentified.

Mr. S. E. Meek (Bull. U. S. Fish Comm., 1883, 430), after a careful comparison of American and European eels, concludes that "in American specimens the dorsal fin is proportionately farther from the end of snout, making the distance between front of dorsal and front of anal a little shorter than in European specimens. Otherwise no permanent difference seems to exist. We should not, therefore, in my opinion, consider the two as distinct species, but rather as geographical varieties of the same species."

In *A. rostrata*, according to Mr. Meek, the distance from tip of snout to front of dorsal is, on an average,  $.33\frac{1}{2}$  of the length; the distance from front of dorsal to front of anal,  $.09\frac{1}{2}$ , or less than length of head ( $.12\frac{1}{2}$ ).

In the European *Anguilla anguilla* the first distance is  $.30\frac{1}{2}$ , the second,  $.13\frac{2}{3}$ , or a little more than length of head ( $.13\frac{1}{2}$ ). Cuban specimens (*Anguilla cubana* Kaup) agree fully with *A. rostrata*, as also Texan ones (*Anguilla "tyrannus"* or *"texana"*).

Probably our eel should be regarded as a subspecies (*rostrata*) of *A. anguilla*.

## Family LXI.—SIMENCHELYIDÆ.

## 183.—SIMENCHELYS Gill. (174)

639. *Simenchelys parasiticus* Gill. B. (589)

## Family LXII.—SYNAPHOBRANCHIDÆ. (54)

## 184.—SYNAPHOBRANCHUS Johnson. (176)

640. *Synaphobranchus pinnatus* Gronow. B. (590)185.—HISTIOBRANCHUS<sup>1</sup> Gill.641. *Histiobranchus infernalis* Gill. B.

## Family LXIII.—NEMICHTHYIDÆ Richardson. (56)

## 186.—NEMICHTHYS Richardson. (178)

642. *Nemichthys scolopaceus* Richardson. B. (592)643. *Nemichthys avocetta* Jordan & Gilbert. B. C. (593)187.—LABICHTHYS<sup>2</sup> Gill & Ryder.644. *Labichthys carinatus*<sup>3</sup> Gill & Ryder. B.645. *Labichthys elongatus*<sup>4</sup> Gill & Ryder. B.<sup>1</sup> HISTIOBRANCHUS Gill.(Gill, Proc. U. S. Nat. Mus., 1883, 255; type, *Histiobranchus infernalis* Gill).“Synaphobranchid, with the dorsal fin protracted almost as far forward as the base of the pectoral fin, and an isolated small patch of teeth on the vomer, behind that on its head.” (“*Iστιον*, sail, i. e., dorsal fin; *βραγχος*, gill; dorsal commencing above gill opening).*Histiobranchus infernalis* Gill, Proc. U. S. Nat. Mus., 1882, 255. Gulf Stream, latitude 38°, at a depth of 1,731 fathoms.<sup>2</sup> LABICHTHYS Gill & Ryder.(Gill & Ryder, Proc. U. S. Nat. Mus., 1883, 261; type, *Labichthys carinatus* Gill & Ryder.)“*Nemichthys* with the head behind the eyes, contracted, with very attenuated jaws, the branchiostegons membrane connected to the throat, and the branchial apertures limited to the sides, with small conical teeth in a band along the vomer, and otherwise dentition of *Nemichthys*, a black epidermis, and the tail abruptly truncated. (*Αρβίς*, a pair of forceps; *λύδης*, fish.) This genus and the two which follow are very insufficiently described. In none of them is the character of the posterior dorsal rays described.<sup>3</sup> *Lubichthys carinatus* Gill & Ryder, Proc. U. S. Nat. Mus., 1883, 261. Gulf Stream, latitude 41°, at 906 fathoms.<sup>4</sup> *Labichthys elongatus* Gill & Ryder, l. c., 1883, 262. Gulf Stream, latitude 39°, at 1,628 fathoms.

188.—**SPINIVOMER**<sup>1</sup> Gill & Ryder.646. *Spinivomer goodei* Gill & Ryder. B.189.—**SERRIVOMER**<sup>2</sup> Gill & Ryder.647. *Serrivomer beani* Gill & Ryder. B.ORDER T—LYOMERI<sup>3</sup>

## Family LXIV.—SACCOPHARYNGIDÆ. (55)

190.—**SACCOPHARYNX** Mitchell. (177)648. *Saccopharynx ampullaceus*<sup>4</sup> Harwood. B. (591)Family LXV.—EURYPHARYNGIDÆ.<sup>5</sup><sup>1</sup> SPINIVOMER Gill & Ryder.(Gill & Ryder, Proc. U. S. Nat. Mus., 1883, 261; type, *Spinivomer goodei* G. & R.)“Nemichthysids with a rectilinear occipitorostral outline, with very attenuated jaws, high mandibular rami, the branchial aperture nearly confluent, enlarged acute conic teeth in a median row on the vomer, and with a silvery epidermis and filiform tail.” (Latin, *spina*, spine; *vomer*, vomer.)*Spinivomer goodei* Gill & Ryder, l. c., 261. Gulf Stream, latitude 38°, at 2,361 fathoms.<sup>2</sup> SERRIVOMER Gill & Ryder.(Gill & Ryder, Proc. U. S. Nat. Mus., 1883, 260; type, *Serrivomer beani* G. & R.)“Nemichthysids with the head behind eyes of an elongated parallelogramic form, with moderately attenuated jaws, branchiostegal membrane confluent at posterior margin, but with the branchial aperture limited by an isthmus except at the margin, and with lanceet-shaped vomerine teeth in a crowded (sometimes doubled) row.” (Latin, *serra*, saw; *vomer*, vomer.)*Serrivomer beani* Gill & Ryder, l. c., 261. Gulf Stream, latitude 41°, at 855 fathoms.<sup>3</sup> Order T.—LYOMERI.

“Fishes with five branchial arches (none modified as branchiostegal or pharyngeal) far behind the skull, an imperfectly ossified cranium articulating with the first vertebra by a basiooccipital condyle alone, only two cephalic arches, both freely movable, (1) an anterior dentigerous one, the palatine, and (2) the suspensorial, consisting of the hyomandibular and quadrate bones, without maxillary bones or distinct bony elements to the mandible, with an imperfect scapular arch remote from the skull, and with separately ossified but imperfect vertebrae.” (Gill &amp; Ryder.)

Two families are recognized (*Saccopharyngidae* and *Eurypharyngidae*), deep-sea fishes of remarkable appearance, allied to the eels. The species are little known, and are possibly all forms of a single one. (*Avos*, loose; *μερος*, part or segment.) (*Lyomeri* Gill & Ryder, Proc. U. S. Nat. Mus., 1883, 263.)<sup>4</sup>The name *Saccopharynx flagellum* was not given by Mitchell, but by Cuvier (*Règne Animal*, Ed. II) in 1829. The name *ampullaceus* of Harwood has therefore priority, it really referring to the same species. For an exhaustive discussion of our knowledge of *Saccopharynx* and its relationships see Gill, Proc. U. S. Nat. Mus., 1884, 48.<sup>5</sup>The family *Eurypharyngidae* is thus defined by Gill & Ryder:“*Lyomeri* with the head flat above and with a transverse rostral margin, at the outer angles of which the eyes are exposed, with the eyes excessively elongated backwards and the upper parallel and closing against each other as far as the articulation

191.—**GASTROSTOMUS**<sup>1</sup> Gill & Ryder.649. *Gastrostomus bairdii* Gill & Ryder. B.ORDER U.—**OPISTHOMI.** (P)Family LXVI.—**PTILICHTHYIDÆ.**<sup>2</sup> (56 b.)192.—**PTILICHTHYS** Bean. (179)650. *Ptilichthys goodei* Bean. A. (594.)Family LXVII.—**NOTACANTHIDÆ.**193.—**NOTACANTHUS** Bloch. (180)651. *Notacanthus chemnitzi* Bloch. G. B. (595)652. *Notacanthus phasganorus* Goode. B. (595 f.)653. *Notacanthus analis*<sup>3</sup> Gill. B.

of the two suspensorial bones, with minute teeth in both jaws, with a short abdomen and long, attenuated tail, branchial apertures narrow and very far behind, dorsal and anal fins continued nearly to the end of the tail, and minute pectoral fins.

"The mandibular rami are exceedingly narrow and slender, but the jaws are extremely expansible and the skin is correspondingly dilatable, consequently an enormous pouch may be developed. Inasmuch as the slenderness and fragility of the jaws and the absence of raptatorial teeth preclude the idea of the species being true fishes of prey, it is probable that they may derive their food from the water which is received into the pouch by a process of selection of the small or minute organisms therein contained." The skin of the pouch has a peculiar velvety appearance, like the wing membrane of a bat. Two species are known, provisionally referred to two genera, *Eurypharynx pelecanoides* Vaillant and *Gastrostomus bairdii*. Both are from great depths in the sea, the former having been taken by the "Travailleur," in 1882, off the coast of Morocco.

(*Eurypharyngidae* Gill & Ryder, Proc. U. S. Nat. Mus., 1883, 264.)

<sup>1</sup> **GASTROSTOMUS** Gill & Ryder.

Gill & Ryder, Proc. U. S. Nat. Mus., 1883, 271; type *Gastrostomus bairdii* G. & R.

This genus is supposed to be distinguished from *Eurypharynx* by the following characters: Cranium short, nearly as broad as long; dentigerous bones almost seven times length of cranium; jaws with minute, acute, conic teeth depressed inwards, in a very narrow band; no enlarged teeth at tip of mandible; tail with a rayless membrane under its tip. (*Γαστηρ*, stomach; *στόμα*, mouth.)

(*Gastrostomus bairdii* Gill & Ryder, l. c., 1883, 271. Gulf Stream, lat. 40°, in deep water.)

*Eurypharynx pelecanoides* (Vaillant, Comptes Rendus Acad. Sci. Paris, 1882, 1232) is supposed to differ in having the "cranium prolonged backwards, the dentigerous bones little more than three times as long as the cranium; faint dentary granulations on both jaws and at the extremity of the mandible two hooked teeth; the tail ending in a point." It is not unlikely that the two species may prove identical.

<sup>2</sup> It is almost certain that *Ptilichthys* has little relation to the *Mastacembelidae*. It should probably be regarded as a distinct family, *Ptilichthyidae*, but whether this family belongs to the *Opisthomii* or to the *Acanthopteri* cannot be ascertained without examination of the skeleton.

<sup>3</sup> *Notacanthus analis* Gill. Proc. U. S. Nat. Mus. 1883, 255. Gulf Stream, latitude 40° at a depth of 548 fathoms.

## ORDER V.—SYNENTOGNATHI. (Q)

Family LXVIII.—BELONIDÆ.<sup>1</sup> (57 pt.)194.—TYLOSURUS<sup>2</sup> Cocco. (181)

654. *Tylosurus hians* Cuv. & Val. W. (696)  
 655. *Tylosurus fodiator*<sup>3</sup> Jordan & Gilbert. P.  
 656. *Tylosurus crassus*<sup>4</sup> Poey. W. (600 b.)  
 657. *Tylosurus caribbaeus* Le Sueur. W. (597)  
 658. *Tylosurus notatus* Poey. W. (598)  
 659. *Tylosurus sagitta*<sup>5</sup> Jordan & Gilbert. W.  
 660. *Tylosurus marinus* Bloch & Schneider. N. S. (599)  
 661. *Tylosurus exilis* Girard. C. (600)  
 662. *Tylosurus stolzmanni*<sup>6</sup> Steindachner. P.

According to Dr. Gill the structure of the skeleton in *Belone*, *Tylosurus* and *Potamorrhaphis* differs so much from that of the other *Scomberesocidae* that these genera should be placed in a distinct family, *Belonidae*.

- The identification of our species of *Tylosurus* may be aided by the following key:
- a. Body strongly compressed, somewhat band-like, about twice as deep as broad; beak slender, the upper jaw strongly arched at base; dorsal and anal very long, the posterior rays elevated: D. 24; A. 25.....HIANS.
  - aa. Body subcylindrical, or not greatly compressed.
    - b. Dorsal and anal long, each with 20 or more rays, their posterior rays prolonged in the young, short in the adult; scales small; beak strong, with large teeth; lateral line passing into a dark-colored keel on tail, no bluish lateral band; size large.
      - c. Beak very strong, not twice as long as rest of head; body comparatively stout; depth about 14.
        - d. Dorsal rays about 19; anal 17. ....FODIATOR.
        - dd. Dorsal rays about 23. A. 23.....CRASSUS.
        - cc. Beak twice or more length of rest of head; body comparatively slender; depth about 18, D. about 25, A. about 24.....CARIBBAEUS.
      - bb. Dorsal and anal short, each with less than 20 rays; the last rays not prolonged; beak long and slender; sides with a bluish lateral band; size small.
        - e. Caudal peduncle posteriorly compressed, the lateral line not dark and not forming a keel.
          - f. Body very broad, robust; dorsal very short, its lobe orange-red in life; maxillary hidden by preorbital. D. 13; A. 14.....NOTATUS.
          - ff. Body very slender, subterete; dorsal moderate, not red; maxillary not hidden by preorbital. Eye small. D. 14, A. 16.....SAGITTA.
        - e. Caudal peduncle posteriorly depressed; lateral line forming a slight keel which is blackish in color; eye rather large; D. 15; A. 18..MARINUS.
        - ee. Caudal peduncle depressed, with a strong keel; maxillary not entirely hidden. D. 15 or 16; A. 17.
          - g. Pectorals plain olivaceous; dorsal and anal lobe pale.....EXILIS.
          - gg. Pectorals abruptly black at tip; dorsal and anal lobes blackish ....STOLZMANNI.

<sup>3</sup> *Tylosurus fodiator* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1881, 459. Mazatlan.

<sup>4</sup> *Belone crassa* Poey, Memorias Cuba, II, 1860, 291 = *Tylosurus gladius* Bean, Proc. U. S. Nat. Mus., 1882, 430 = *Tylosurus crassus* Jordan, Proc. U. S. Nat. Mus., 1884, 112 (not *Belone jonesi* Goode). Pensacola southward.

<sup>5</sup> *Tylosurus sagitta* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1884, 25. Key West.

<sup>6</sup> *Belone stolzmanni* Steindachner, Ichthyol. Beiträge, VII, 21, 1878 = *Tylosurus sierrita* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1881, 458. Gulf of California to Peru.

195.—**SCOMBERESOX** Lacépède. (182)663. **Scomberesox saurus** Walbaum. N. S. O. Eu. (601)664. **Scomberesox brevirostris** Peters. C. (602)196.—**HEMIRHAMPHUS** Cuvier. (183)665. **Hemirhamphus unifasciatus**<sup>1</sup> Ranzani. W.666. **Hemirhamphus roberti**<sup>2</sup> Cuv. & Val. S.P. (603)667. **Hemirhamphus rosae** Jordan & Gilbert. C. (604)668. **Hemirhamphus pleei**<sup>3</sup> Cuv. & Val. S.W.P. (604 b.)197.—**EULEPTORHAMPHUS** Gill. (183 b.)669. **Euleptorhamphus longirostris** Cuvier. O. (605)198.—**CHRIODORUS** Goode & Bean. (183 c.)670. **Chriodus atherinoides** Goode & Bean. W. (605 b.)199.—**PAREXOCETUS** Bleeker.671. **Parexocetus mesogaster**<sup>4</sup> Bloch. W. S. (607 b.)200.—**HALOCYPSELUS** Weinland. (184)672. **Halocypselus evolans**<sup>5</sup> Linnaeus. S. (606; 607)

<sup>1</sup> *Hemirhamphus unifasciatus* Ranzani. Clear greenish with bluish luster; a silvery lateral band; no red on fins; tip of lower jaw scarlet. Very close to *H. unifasciatus*, differing chiefly in the shorter beak, and the less compressed and more robust body. Lower jaw from end of upper jaw 6 to 7 in total length from its tip to base of caudal, ( $4\frac{1}{2}$  in *H. roberti*) its length always less than that of rest of head; head with lower jaw, 3; body half deeper than broad; premaxillaries broader than long; eye less than interorbital width,  $\frac{2}{3}$  postorbital part of head; ventrals midway between eye and base of caudal; dorsal and anal densely scaly; back broad. Head  $4\frac{1}{2}$ , depth  $6\frac{1}{2}$ . D. 12 to 14, A. 15, lat. 1.52, length 12 inches. Florida Keys to Cuba and Panama, representing *H. roberti* southward.

*Hemirhamphus unifasciatus* Ranzani, Comm. Inst. Bon., 1842, V. 326, tab. 25: not of most recent authors; ? *Hemirhamphus picturi* Cuv. & Val. XIX, 1846, 25 (*Hemirhamphus richardi* Cuv. & Val., XIX, 1846, 26; *Hemirhamphus fasciatus* Poey, Memorias Cuba, II, 299, 1860, not of Bleeker; *Hemirhamphus poeyi* Günther, VI, 262).

<sup>2</sup> The species called in the text *Hemirhamphus unifasciatus* should stand as *Hemirhamphus roberti* Cuv. & Val. Lower jaw longer than rest of head. South Atlantic coast of United States and southward, also on the Pacific coast southward.

Instead of the synonymy in the text read: (*Hemirhamphus roberti* Cuv. & Val., XIX, 1846, 24; Günther VI, 263, *Hemirhamphus unifasciatus* of most recent American authors, not of Ranzani, whose species is the short billed one.)

A discussion of the species of this genus is given by Meek & Goss, Proc. Ac. Nat. Sci. Phila., 1884.

<sup>3</sup> The species called in the Synopsis (p. 902), *Hemirhamphus brasiliensis*, should apparently stand as *Hemirhamphus pleei*.

<sup>4</sup> *Exocetus mesogaster* Bloch, Ichthyol., XII, tab. 399 = *Exocetus hillianus* Gosse. See Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 588.)

<sup>5</sup> *Exocetus obtusirostris* Günther, seems to be identical with *H. evolans*.

201.—**EXOCETUS**<sup>1</sup> Linnaeus. (185, 186)

673. **Exocetus exiliens**<sup>2</sup> Gmelin. O. S. (613)  
 674. **Exocetus rondeletii**<sup>3</sup> Cuv. & Val. S. O. En. (609)  
 675. **Exocetus vinciguerræ**<sup>4</sup> Jordan & Meek. N. O. (609)  
 676. **Exocetus volitans**<sup>5</sup> Linnaeus. N. S. W. (611)  
 677. **Exocetus heterurus** Rafinesque. N. S. En. (610, 613)  
 678. **Exocetus furcatus** Mitchell. O. (612)  
 679. **Exocetus californicus** Cooper. C. P. (608)  
 680. **Exocetus gibbifrons** Cuv. & Val. O.

## ORDER W.—LOPHIOBRANCHII. (R.)

## Family LXIX.—SYNGNATHIDÆ. (58, 59)

202.—**SIPHOSTOMA** Rafinesque (187)

681. **Siphostoma zatropis** Jordan & Gilbert. W. (618 b.)  
 682. **Siphostoma punctipinne** Gill. C. (618)  
 683. **Siphostoma californiense** Storer. C. (616)  
 684. **Siphostoma griseolineatum** Ayres. C. (616 b.)  
 685. **Siphostoma auliscus** Swain. C. (617 b.)  
 686. **Siphostoma barbareæ**<sup>6</sup> Swain & Meek. C. (616 c.)  
 687. **Siphostoma bairdianum**<sup>7</sup> Duméril. P.

<sup>1</sup> It is probable that *Cypselurus* is a young stage of *Exocetus*. I have found on specimens of *Exocetus mesogaster* two short barbels at the symphysis of the lower jaw, while in adult examples there is no trace of these appendages. For a full account of our species of this genus, see Jordan & Meek, Proc. U. S. Nat. Mus. 1885.

<sup>2</sup> The following is Gmelin's account of *Exocetus exiliens*:

<sup>3</sup> “*Exocetus pinnis ventralibus caudam attingentibus*. D. 10, P. 15, V. 6, A. 11, C. 26. Habitat ad Carolinam, volitante statura simillimus, at vix digito longior, neque argentens. Garden.

“Pinne pallidæ, fascia una alterave nigricante, ventrales \* \* apice pinnam canadæ attingentes, & a caudæ remotaæ, \* \* inter caput et annum mediæ, radio primo brevi, pectorales, radio primo et secundo brevibus; caudalis lobus inferior longior.” (Gmelin.)

<sup>2</sup> *Exocetus volador* Jordan, Proc. U. S. Nat. Mus., 1884, 34.

<sup>4</sup> *Exocetus rondeletii*, Synopsis, p. 904, not of C. & V.; Lütken, Vid. Meddel. Naturh. Foren., 1876, 110.)

<sup>5</sup> *Exocetus volitans* L. = *Exocetus melanurus* Synopsis, p. 179; nec Cuv. & Val.; *Exocetus exiliens* Synopsis, p. 904, not of Gmelin; *Exocetus affinis* Günther, VI, 288; *Exocetus roberti* Müller & Troschel, Schomburgk, Excurs. Barbadoes, 675 (probably).

<sup>6</sup> The species, called in the Synopsis, *Siphostoma bairdianum*, should stand as *Siphostoma barbareæ* Swain & Meek, Proc. U. S. Nat. Mus., 1884, 238. Santa Barbara.

<sup>7</sup> The original *Syngnathus bairdianus*, from the “coast of Mexico near California,” proves to be a different species, having the technical characters of *S. affine*, but with the snout longer and the crest on top of head rather feebler. The following is Duméril's original description:

Head scarcely  $\frac{1}{2}$  of total length, a little longer than dorsal base; muzzle longer by a third than postocular part of head and equal to distance from front of eye to second ring; median crest of head and nape feeble; that of opercle very small. Rings 17 + 31. Tail at least half longer than trunk. Dorsal on 3 + 6 rings. P. 15, D. 30, A. 3, C. 6. Yellowish, sutures marked, except below, by a brown line. Coast of Mexico, near California.

688. *Siphostoma leptorhynchum* Girard. C. (617)  
 689. *Siphostoma floridæ* Jordan & Gilbert. S. (615 b.)  
 690. *Siphostoma affine* Günther. S. W. (614 b.)  
 691. *Siphostoma louisianæ* Günther. S. (615)  
 692. *Siphostoma fuscum* Storer. N. (614)  
 693. *Siphostoma mackayi*<sup>1</sup> Swain & Meek. W.  
 694. *Siphostoma crinigerum*<sup>2</sup> Bean & Dresel. S. W.

203.—**DORYRHAMPHUS**<sup>3</sup> Kaup.

695. *Doryrhamphus californiensis* Gill. P.

204.—**HIPPOCAMPUS**<sup>4</sup> Linnæus.

696. *Hippocampus ingens* Girard. C. P. (620)  
 697. *Hippocampus punctulatus* Guichenot. W. (619 b.)  
 698. *Hippocampus hudsonius* Dekay. N. S. (619 c.)  
 699. *Hippocampus stylifer* Jordan & Gilbert. S. (619 d.)  
 700. *Hippocampus zosteræ* Jordan & Gilbert. S. (619 e.)

ORDER X.—HEMIBRANCHII. (S)

Family LXX.—MACRORHAMPHOSIDÆ. (60)

205.—**MACRORHAMPHOSUS**<sup>5</sup> Lacépède. (189)

701. *Macrorhamphosus scolopax* Linnæus. Eu. (621)

<sup>1</sup> *Siphostoma mackayi* Swain & Meek, Proc. U. S. Nat. Mus., 1884, 239; Key West. In this paper is a very useful analysis of the characters of the species of this genus, supplementary to a paper on the same subject by Mr. Swain, Proc. U. S. Nat. Mus., 1882, 307.

<sup>2</sup> *Siphostoma crinigerum* Bean & Dresel, Proc. Biol. Soc. Washington, II, 1884, 99. Swain & Meek, Proc. U. S. Nat. Mus., 1884, 239. Pensacola to Key West.

<sup>3</sup> **DORYRHAMPHUS** Kaup.

(Kaup, Lophobranchii, 1856, 54; type *Doryrhamphus excisus* Kaup.)

This genus differs from *Siphostoma* chiefly in the position of the egg-pouch of the male, which is under the abdomen instead of the tail. The angles of the body are strongly ridged. Tropical seas. (*Δορυ*, lance; *ραυφος*, snout.)

*Doryrhamphus californiensis* Gill.

Yellowish brown, with a black streak from snout to axil. Snout half as long as head, its crest formed of about ten irregular teeth, behind which are two others. Double frontal crest well serrated. Ridge under orbit unarmed, but on side of snout it is well serrated. Chin prominent but unarmed. Pectorals as long as opercle. Caudal as long as snout. D. 25. Rings 20+16. Cape San Lucas (Gill). The types are lost and no specimens have been since recorded.

(Gill, Proc. Ac. Nat. Sci. Phila., 1862, 284: *Doryichthys californiensis* Günther VIII, 186.)

<sup>4</sup> The family *Hippocampidae* should be, apparently, reunited with the *Syngnathidae*. I here omit *Hippocampus hippocampus* (= *heptagonus* Raf.; *antiquorum*, Leach), not believing that that species has been actually taken in American waters.

<sup>5</sup> The reasons for using the name *Macrorhamphosus* for this genus instead of *Centrisicus* are stated in Proc. U. S. Nat. Mus., 1882, 575. The original type of *Centrisicus* is *C. scutatus*.

A valuable discussion of "the mutual relations of the *Hemibranchiate* fishes" is given by Dr. Gill, Proc. Ac. Nat. Sci. Phila., 1884, 154.

## Family LXXI.—FISTULARIIDÆ. (61)

206.—**FISTULARIA** Linnæus. (190)702. *Fistularia tabaccaria* Linnæus. S. W. (622)703. *Fistularia serrata* Cuvier. O. (623)704. *Fistularia depressa*<sup>1</sup> Günther. P.

## Family LXXII.—AULOSTOMIDÆ. (62)

207.—**AULOSTOMA** Lacépède. (191)705. *Aulostoma maculatum* Valenciennes. W. (624)

## Family LXXIII.—AULORHYNCHIDÆ. (63)

208.—**AULORHYNCHUS** Gill. (191)706. *Aulorhynchus flavidus* Gill. C. A. (625)

## Family LXXIV.—GASTEROSTEIDÆ. (64)

209.—**PYGOSTEUS** Brevoort.707. *Pygosteus pungitius* Linnæus. N. Eu. (626)707b. *Pygosteus pungitius concinnus* Richardson. Vn.707c. *Pygosteus pungitius brachypoda* Bean. G.210.—**EUCALIA** Jordan.708. *Eucalia inconstans* Kirtland. Vn. (627)708b. *Eucalia inconstans cayuga* Jordan. Vne.211.—**GASTEROSTEUS** Linnæus. (193)709. *Gasterosteus williamsoni*<sup>2</sup> Girard. T.710. *Gasterosteus microcephalus* Girard. C. A. (628)711. *Gasterosteus (gymnurus?) cuvieri* Girard. G. (629)711b. *Gasterosteus (cuvieri?) wheatlandi* Putnam. N.712. *Gasterosteus atkinsi* Bean. Vne. (630)713. *Gasterosteus aculeatus* Linnæus. N. Eu. (631)713b. *Gasterosteus aculeatus calaphractus* Pallas. A. (631b)212.—**APELTES** Dekay. (194)714. *Apeltes quadracus* Mitchell. N. (632)

<sup>1</sup> *Fistularia depressa* Günther, Rept. Shore Fishes; Challenger, 1880, 69; East Indies, Australia, China, and Lower California. Abundant in the Gulf of California. Bones of the head less deeply sculptured than in *F. serrata*, but with the two upper lateral ridges of the snout also serrated; interorbital space nearly flat. Two middle ridges on upper surface of snout not very close together, diverging again on anterior half of length of snout, converging again finally on the foremost part. Body much depressed, nearly smooth, the skin being scarcely rough.

<sup>2</sup> For a description of this species, see Rosa Smith, Proc. U. S. Nat. Mus., 1883, 217. It is a true *Gasterosteus*, and not an *Eucalia*, although having the naked skin of the latter genus.

## ORDER Y.—PERCESOCES.

## Family LXXV.—MUGILIDÆ. (65)

## 213.—MUGIL Linnaeus. (193)

715. *Mugil cephalus*<sup>1</sup> Linnaeus. N. S. W. P. C. En. (633, 634)  
 716. *Mugil gaimardianus*<sup>2</sup> Poey. W.  
 717. *Mugil curema*<sup>3</sup> Cuvier & Valenciennes. N. S. W. P. (635)  
 718. *Mugil trichodon*<sup>4</sup> Poey. W.

214.—CHÆNOMUGIL<sup>5</sup> Gill.

719. *Chænomugil proboscideus* Günther. P.

215.—QUERIMANA<sup>6</sup> Jordan & Gilbert.

720. *Querimana harengus* Günther. P.  
 721. *Querimana gyrans* Jordan & Gilbert. S. W.

216.—AGONOSTOMUS<sup>7</sup> Bennett.

722. *Agonostomus nasutus* Günther. P.

<sup>1</sup> The American species (*albula*) seems to be identical with the European (*cephalus*). For a detailed account of the American *Mugilidæ*, see Jordan & Swain, Proc. U. S. Nat. Mus., 1884, 261.

<sup>2</sup> *Mugil gaimardianus* Poey, Ann. Lyc. Nat. Hist., N. Y., 1875, 64. Cuba, Key West. See Jordan & Swain, l. c.

<sup>3</sup> *Mugil curema* Cuv. & Val. = *Mugil brasiliensis* of authors, not of Agassiz. See Jordan & Swain, l. c.

<sup>4</sup> *Mugil trichodon* Poey. Cuba and Key West.

In the paper above cited, we have adopted the name *Mugil brasiliensis* for this species. This is perhaps too hasty, as the *Mugil brasiliensis* of Agassiz seems at least as likely to have been *Mugil liza*.

## 5 CHÆNOMUGIL Gill.

(Gill, Proc. Ac. Nat. Sci., Phila., 1863, 169; type *Mugil proboscideus* Günther.)

Cleft of mouth lateral; lower jaw narrow; dentiform cilia in very many series, somewhat pavid; upper lip very thick; no adipose eyelid. Vertical fins scaly. One species known. (*Xarw*, to gape; *Mugil*.)

*Chænomugil proboscideus* Günther = *Mugil proboscideus* Günther, iii, 1861, 459. Mazatlan to Panama.

## 6 QUERIMANA Jordan &amp; Gilbert.

(Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 588; type *Myxus harengus* Günther.)

This genus differs from *Mugil* chiefly in the presence of but two spines in the anal fin. The species are of small size, and some of them swim in schools at the surface.

*Querimana harengus* Günther. *Myxus harengus* Günther, iii, 467, 1861 = *Querimana harengus* Jordan & Swain, Proc. U. S. Nat. Mus., 1882, 274. Mazatlan to Peru; abundant.

*Querimana gyrans* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1884, 26. Charleston to Key West.

## 7 AGONOSTOMUS Bennett.

(*Cestrerus*, *Dajaus* and *Nestis* Cuv. & Val.).

(Bennett, Proc. Comm. Zoöl. Soc., 1830, 166; type *Agonostomus telfairi* Bennett.)

Fresh water mullets with cleft of the mouth extending laterally about to front of eye. Small teeth in one or both jaws and sometimes on the vomer. Edge of lower lip rounded, not sharp. Stomach not gizzard like. Anal spines 3. Streams of mountainous regions in the tropics. (*Aγωρος*, not angulated; *στοιχα*, mouth.)

*Agonostoma nasutum* Günther, 111, 463; Jordan & Gilbert, Proc. U. S. Mus., 379. Streams of Lower California and Guatemala.

## Family LXXVI.—ATHERINIDÆ. (66)

## 217.—ATHERINA Linnaeus. (196)

723. *Atherina eriarcha*<sup>1</sup> Jordan & Gilbert. P.  
 724. *Atherina carolina* Cuv. & Val. S. (636)  
 725. *Atherina stipes*<sup>2</sup> Müller & Troschel. W. (637)  
 726. *Atherina aræa*<sup>3</sup> Jordan & Gilbert. W.

## 218.—LEURESTHES Jordan &amp; Gilbert. (197)

727. *Leuresthes tenuis* Ayres. C. (635)

## 219.—LABIDESTHES Cope. (198)

728. *Labidesthes sicculus* Cope. Ve. (639)

## 220.—MENIDIA Bonaparte. (199)

729. *Menidia laciniata* Swain. S. (640)  
 730. *Menidia vagrans* Goode & Bean. S. (641)  
 731. *Menidia notata* Mitchell. N. (642)  
 732. *Menidia audens* Hay. Vs. (642b)  
 733. *Menidia beryllina* Cope. Ve. (643)  
 734. *Menidia menidia*<sup>4</sup> Linnaeus. S. (644)  
 735. *Menidia peninsulae* Goode & Bean. S. (645)

## 221.—ATHERINOPSIS Girard. (200)

736. *Atherinopsis californiensis* Girard. C. (646)

## 222.—ATHERINOPS Steindachner. (201)

737. *Atherinops affinis* Ayres. C. (647)

## Family LXXVII.—SPHYRÆNIDÆ. (67)

## 223.—SPHYRÆNA Bloch. (202)

738. *Sphyraena argentea* Girard. C. P. (648)  
 739. *Sphyraena borealis*<sup>5</sup> De Kay. N. (649)  
 740. *Sphyraena guaguanche* Cuv. & Val. S. W. (650)  
 741. *Sphyraena picuda* Bloch & Schneider. S. W. (650 b.)  
 742. *Sphyraena ensis* Jordan & Gilbert. P.

<sup>1</sup>*Atherinella eriarcha* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1881, 348. Mazatlan to Peru.

<sup>2</sup>*Atherina stipes* Müller & Troschel = *Atherina laticeps* Poey = *Atherina relicana* Goode & Bean. See Jordan & Gilbert, Proc. U. S. Nat. Mus., 1884, 116.

<sup>3</sup>*Atherina aræa* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1884, 27. Key West.

<sup>4</sup>Called *Menidia boscii* in the Synopsis, pp. 408, 909.

<sup>5</sup>Called *Sphyraena spet* in the Synopsis, p. 411. Ours is, however, apparently distinct from the latter species, which is European.

<sup>6</sup>*Sphyraena ensis* Jordan & Gilbert, Bull. U. S. Fish Comm., 1881, 106, based on *Sphyraena forsteri* Steindachner, Ichth. Beiträge, VII, 4, 1878, not *Sphyraena forsteri* C. & V.

Body moderately elongate; eye 6 to 7 in head; snout  $2\frac{1}{2}$ ; pectoral  $2\frac{1}{2}$ . Pectoral reaching about to front of first dorsal. Ventrals inserted before first dorsal. Canine teeth of lower jaw, palatines, and inner row of premaxillary very large, much as in *S. picuda*. Maxillary reaching about to front of dorsal. Silvery, darker above, with traces of numerous vague darker cross-bars. Head 4; depth 8 or 9. D. V-1, 9; A. 11. S. Lat. l. 110. Gulf of California to Panama.

For a detailed account of our species of this genus, see Meek & Newland, Proc. Ac. Nat. Sci. Phila., 1884.

## Family LXXVIII.—POLYNEMIDÆ. (68)

224.—**POLYNEMUS** Linnaeus.743. **Polynemus virginicus**<sup>1</sup> Linnaeus. W. (650c)744. **Polynemus approximans**<sup>2</sup> Lay & Bennett. P.745. **Polynemus opercularis**<sup>3</sup> Gill. P.746. **Polynemus octonemus**<sup>4</sup> Girard. S.ORDER Z.—PERCOMORPHI.<sup>5</sup>

## Family LXXIX.—AMMODYTIDÆ. (69)

225.—**AMMODYTES** Linnaeus. (204, 205)747. **Ammodytes americanus** DeKay. N. (652, 656)747b *Ammodytes americanus personatus* Girard. A. C. (653)748. **Ammodytes alascanus** Cope. A. (654)749. **Ammodytes dubius** Reinhardt. B. (655)

## Family LXXX.—ECHENEIDIDÆ. (70)

226.—**ECHENEIS**. (206)750. **Echeneis naucrates** Linnaeus. N. S. O. W. P. C. (657)227.—**PHTHEIRICHTHYS** Gill. (206b.)751. **Phtheirichthys lineatus** Menzies. S. W. (657 b.)228.—**REMORA** Gill. (206c)752. **Remora remora** Linnaeus. S. O. W. P. C. (658)753. **Remora brachyptera** Lowe. W. O. (659)754. **Remora albescens**<sup>6</sup> Temminck & Schlegel. P. S.229.—**RHOMBOCHIRUS** Gill. (207)755. **Rhombochirus osteochir** Cuvier. O. W. (660)

<sup>1</sup> *Polynemus virginicus* L. Syst. Nat.=*Polydactylus plumieri* Lacépède. See Jordan, Proc. U. S. Nat. Mus., 1884, 118.

<sup>2</sup> *Polynemus approximans* Lay & Bennett, Beechey's Voyage, Zool. Fish, 57; Günther, Fish. Centr. Amer., 1869, 423. Gulf of California to Panama.

<sup>3</sup> *Trichidion opercularis* Gill, Proc. Ac. Nat. Sci. Phila., 1863, 169= *Polynemus melanopoma* Günther, Fish. Centr. Amer. 1869, 421. Gulf of California to Panama.

<sup>4</sup> *Polyneus octofilis* Gill is without much doubt the adult form of *P. octonemus*. See Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 590. The pectoral fin grows darker in color and the pectoral filaments shorter with age in other species of *Polynemus* and probably in this one also.

<sup>5</sup> *Percomorpha* and *Pharyngognathi* Cope, Trans. Am. Philos. Soc. Phila., 1871, 458 (exclusive of the *Rhegnopteri*=*Polynemidae*, which have the ventral fins truly abdominal and may be placed in the *Percesoces*.)

<sup>6</sup> *Echeneis albescens* Temminck & Schlegel, Fauna Japonica, Poiss., 272; Günther II, 377; Streets, Bull. U. S. Nat. Mus., 1877, VII, 54. Coasts of Eastern Asia, a specimen taken at La Paz, Gulf of California (*Streets*) and in the Gulf of Mexico (*Bear*). D. XIII-22; A. 22.

The *Echeneididae* are regarded by Dr. Gill as constituting a distinct suborder, *Discocephali*, defined by him Proc. U. S. Nat. Mus., 1882, 563.

## Family LXXXI.—ELACATIDÆ. (71)

230.—**ELACATE** Cuvier. (208)

- 756.
- Elacate canada**
- Linnæus. S. W. O. (661)

## Family LXXXII.—XIPHIIDÆ. (72)

231.—**XIPHIAS** Linnæus. (209)

- 757.
- Xiphias gladius**
- Linnæus. O. N. S. W. C. (662)

232.—**TETRAPTURUS** Rafinesque. (210)

- 758.
- Tetrapurus albidus**
- Poey. W. S. (663)

233.—**ISTIOPHORUS** Lacépède. (211)

- 759.
- Istiophorus americanus**
- <sup>1</sup>
- Cuv. & Val. (665)

## Family LXXXIII.—TRICHIURIDÆ. (73)

234.—**TRICHIURUS** Linnæus. (212)

- 760.
- Trichiurus lepturus**
- Linnæus. O. S. W. P. (666)

235.—**BENTHODESMUS** Goode & Bean. (212b.)

- 761.
- Benthodesmus elongatus**
- Clarke. B. (666b.)

236.—**LEPIDOPUS** Gonan.

- 762.
- Lepidopus caudatus**
- Euphrasen. O. P.

<sup>1</sup> The genuine *Istiophorus gladius* is an East Indian species, not known from our coasts. The American species is:

*Istiophorus americanus* Cuv. & Val. *Sail-fish*; *Spike-fish*. Bluish-black, paler below; dorsal dusky-blush; its membranes with many nearly round black spots, from  $\frac{1}{2}$  to  $\frac{1}{4}$  diameter of orbit. Snout, from eye,  $2\frac{1}{2}$  times length of rest of head. Lower jaw  $2\frac{1}{2}$  in head. Front of eye nearly midway between tip of lower jaw and edge of opercle. Interorbital space broad, flattish,  $1\frac{1}{3}$  in postorbital part of head. Maxillary reaching to slightly beyond eye, which is  $3\frac{1}{3}$  in postorbital part of head and 10 in snout. Sword narrow, regularly tapering, depressed, its upper and lower surfaces both rounded, its edges blunt and rougher than its upper side. For its entire length it is nearly twice as broad as deep. Breadth of snout at the middle point between its tip and the eye contained 25 times in its length from the eye. Longest dorsal spine  $\frac{4}{5}$  total length of head. Ventrals  $1\frac{5}{6}$  in head. Pectorals  $3\frac{2}{3}$ . Caudal lobes  $1\frac{1}{3}$ . D. XLI-7; A. 9-7. Head  $2\frac{2}{3}$  ( $3\frac{1}{3}$  in length with caudal); depth about 6. Length of specimen described (Key West) 6 feet.

West Indies and warmer parts of the Atlantic, north to Cape Cod and France. Differing from the East Indian *I. gladius* in the longer and slenderer sword and in the shorter dorsal fin.

(? *Makaira nigricans* Lacépède, Hist. Nat. Poiss. IV, 688, 1803. *Histiophorus americanus* Cuv. & Val., VIII, 303, 1831; ? *Histiophorus gracilirostris* C. & V., VIII, 308; ? *Histiophorus ancipitirostris* Cuv. & Val., VIII, 309. I here restore the original orthography of the name *Istiophorus*.)

. . . <sup>2</sup> **LEPIDOPUS** Gonan.

(Gouan, Hist. Poiss. 1770, 185; type *Lepidopus gouani* Bl. & Schu. = *Trichiurus caudatus* Euphrasen.)

This genus differs from *Trichiurus* chiefly in the less elongate form of the tail, which

## Family LXXXIV.—SCOMBRIDÆ. (74)

237.—**SCOMBER** Linnaeus. (213)§ *Pneumatophorus* Jordan & Gilbert.763. **Scomber colias**<sup>1</sup> Gmelin. Eu. N. S. P. C. (667, 667b.)  
§ *Seomber*.764. **Scomber scombrus** Linnaeus. N. S. O. Eu. (668)  
238.—**AUXIS** Cuvier. (214)765. **Auxis thazard** Lacépède. W. N. (Acc.) O. (669)  
239.—**SCOMBEROMORUS** Lacépède. (215)766. **Scomberomorus concolor** Lockington. C. (670)767. **Scomberomorus maculatus** Mitchell. N. S. P. (671)768. **Scomberomorus regalis** Bloch. W. (672)769. **Scomberomorus cavalla**<sup>2</sup> Cuvier. W. S. (673)240.—**ACANTHOCYBIUM**<sup>3</sup> Gill.770. **Acanthocybium solandri** Cuv. & Val. W. O.

is provided with a small, deeply forked caudal fin. The ventral fins are represented by a pair of scale-like appendages. A single species; pelagic. (*λέπις*, scale; *πόδης*, foot.)

*Lepidopus caudatus*. Scabbard-fish. For description, see Günther II, 344. Pelagic; a specimen taken by John Xantus at Cape St. Lucas.

<sup>1</sup> It is probable that *Scomber pneumatophorus* is identical with *Scomber colias*.

<sup>2</sup> This species was first indicated as *Cybum caralla* Cuvier, Régne Animal, 1829. It is the king-fish of the Florida Keys, a food fish of the highest importance. For a detailed account of the species of *Scomberomorus* see Meek and Newland, Proc. Ac. Nat. Sci. Phila., 1884.

<sup>3</sup> **ACANTHOCYBIUM** Gill.

(Gill, Proc. Ac. Nat. Sci. Phila., 1862; type *Cybum sara* Bennett.)

This genus is allied to *Scomberomorus*, but shows several of the peculiarities of the sword-fishes, indicating a transition toward the *Xiphiidae*. The head is very long, slender, and pointed, the mandible being longer than the upper jaw, the jaws forming a sort of beak; cleft of the mouth extending to below the eye; the posterior part of the maxillary covered by the preorbital; both jaws armed with a close series of trenchant teeth, ovate or truncate; their edges finely serrate; villiform teeth on vomer and palatines; gills formed as in *Xiphias*, their laminae forming a net-work; scales small, scarcely forming a corselet; those along the base of dorsal enlarged and lanceolate; keel strong; caudal spinous dorsal very long, its spines about 25 in number.

Very large mackerels, pelagic; probably a single species widely distributed; most abundant about the Florida Straits. (*Ακαρθα*, spine; *Cybum*.)

*Acanthocybium solandri*. *Peto*; *Wahoo*; *Barracotta*.

Iron gray, dark above; paler below; no distinct markings; fins colored like the body; eye 5 in snout; gape more than half length of head; premaxillaries in front prolonged in a sort of beak which is nearly half length of snout; teeth somewhat irregular, the posterior much largest. Dorsal spine mostly subequal, the highest, behind the middle of the fin, 5½ in head; dorsal and anal lobes low. Caudal lobes short, very abruptly spreading, their length about ½ head. Pectoral not quite half head. D. XXIV-1, 12-IX; A. 1, 12-IX. Length 4 to 8 feet. Tropical seas; not rare about Cuba, where it spawns; north to Key West.

*Cybum solandri* Cuv. & Val., VIII, 1831, 192; *Cybum sara* Bennett, Beechey's Voyage, Zoölogy, 1849, 63; *Cybum sara* Günther, II, 373; *Cybum petus* Poey, Memorias Cuba, II, 234, 1860; *Acanthocybium petus* Poey, Ennum. Pisc. Cubens., 1875, 73. Lütken, Spolia Atlantica, 1880, 481-597; *Cybum rerangi* Doderlein, Giorn. Sci. Natur. Econ. Palermo, 1872.



778. *Decapterus macarellus* Cuv. & Val. W. S. (683)  
 778 b. *Decapterus macarellus hypodus*<sup>1</sup> Gill. P.

245.—**TRACHURUS** Rafinesque. (219)

779. *Trachurus picturatus* Bowdich. C. Eu. P. (680)  
 780. *Trachurus trachurus* Linnaeus. W. P. (681)

246. **TRACHUROPS** Gill.

781. *Trachurops crumenophthalmus* Bloch. W. P. (684)

247.—**CARANX** Lacépède.

§ *Hemicaranx* Bleeker.

782. *Caranx amblyrhynchus* Cuv. & Val. S. W. (689)

§ *Uraspis* Bleeker.

783. *Caranx vinctus*<sup>2</sup> Jordan & Gilbert P.

784. *Caranx bartholomaei*<sup>3</sup> Cuv. & Val. W. (687, 688)

§ *Caranx*.

785. *Caranx chrysus* Mitchell. N. S. W. (685)

- 785 b. *Caranx chrysus caballus* Günther. P. W. (686)

786. *Caranx latus*<sup>4</sup> Agassiz. S. W. P. (690)

787. *Caranx hippos* Linnaeus. N. S. W. P. (691)

§ *Gnathanodon* Bleeker.

788. *Caranx speciosus*<sup>5</sup> Forskål. P.

§ *Citula* Cuvier.

789. *Caranx dorsalis*<sup>6</sup> Gill. P.

§ *Blepharis* Cuvier.

790. *Caranx crinitus* Mitchell. N. S. W. P. (692)

aa. Premaxillaries not protractile (except in the very young); pectoral fins short rounded; soft dorsal similar to anal, both much longer than abdomen; lateral line unarmed. (*Scembroidinae*)

l. Maxillary without supplemental bone; no pterygoid teeth; scales linear, imbedded..... *OLIGOPLITES*.

A detailed account of the American species of *Caranginae* is given by Jordan & Gilbert, Proc. U. S. Nat. Mus., 1883, 188.

<sup>1</sup> *Decapterus hypodus* Gill, Proc. Ac. Nat. Sci., Phila., 1862, 261; Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 358; 1883, 190. Cape San Lucas.

<sup>2</sup> *Caranx vinctus* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 349. Mazatlan.

<sup>3</sup> *Caranx bartholomaei* Cuv. & Val., IX, 1833, 100 = *Caranx cibi* Poey, Memorias Cuba, II, 224, 1860 = *Caranx heani* Jordan, Proc. U. S. Nat. Mus., 1880, 486. See Jordan & Gilbert, Proc. U. S. Nat. Mus., 1884, 32.

<sup>4</sup> *Caranx latus* Agassiz; *Caranx fallax* Cuv. & Val. See Jordan & Gilbert, Proc. U. S. Nat. Mus., 1883, 200.

<sup>5</sup> *Scember speciosus* Forskal, Deser. Anim., 1775, 54 = *Caranx panamensis* Gill, Proc. Ac. Nat. Sci. Phila., 1863, 166. See Jordan & Gilbert, Proc. U. S. Nat. Mus., 1883, 201. Mazatlan to Panama and west to the Red Sea.

<sup>6</sup> *Carangooides dorsalis* Gill, Proc. U. S. Nat. Mus., 1863, 166 = *Caranx otrynter* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1883, 202. Mazatlan to Panama.

248.—**VOMER** Cuvier.791. **Vomer setipinnis** Mitchell. N. S. W. P. (694)249.—**SELENE** Lacépède. (223)792. **Selene orstedii**<sup>1</sup> Lütken. P.793. **Selene vomer** Linnaeus. N. S. W. P. (693)250.—**CHLOROSCOMBRUS** Girard. (224)794. **Chloroscombrus chrysurus** Linnaeus. S. W. (695)795. **Chloroscombrus orqueta**<sup>2</sup> Jordan & Gilbert. P.251.—**TRACHYNOTUS** Lacépède.796. **Trachynotus carolinus** Linnaeus. N. S. W. P.? (696)797. **Trachynotus argenteus**<sup>3</sup> Cuv. & Val. N.798. **Trachynotus rhodopus**<sup>4</sup> Gill. W. P. (698)799. **Trachynotus kennedyi**<sup>5</sup> Steindachner. P.800. **Trachynotus rhombooides** Bloch. S. W. (697)801. **Trachynotus glaucus** Bloch. S. W. (699)802. **Trachynotus fasciatus**<sup>6</sup> Gill. P.252.—**NAUCRATES** Rafinesque. (226)803. **Naucrates ductor** Linnaeus. O. (700.)253.—**SERIOLA** Cuvier. (227)804. **Seriola zonata** Mitchell. N. (704)804b. **Seriola zonata carolinensis** Holbrook. S. (703)805. **Seriola dumerili**<sup>7</sup> Risso. S. W. Eu.805b. **Seriola dumerili lalandi**. S. W. (701b.)<sup>1</sup> *Selene orstedii* Lütken, Spolia Atlantica, 1880, 144; Jordan & Gilbert, l. c. 205. Mazatlan to Panama.<sup>2</sup> *Chloroscombrus orqueta* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 646. Magdalena Bay to Panama.<sup>3</sup> *Trachynotus argenteus* Cuv. & Val., VIII, 413. According to Dr. Bean, this is probably a valid species, allied to *T. carolinus*, but with the body deeper, the depth being half the length without caudal. New York.A review of the American species of *Trachynotus* is given by Meek and Goss in the Proc. Ac. Nat. Sci. Phila., 1884.<sup>4</sup> The species called in the synopsis "*Trachynotus goreensis*" should stand as *Trachynotus rhodopus* Gill. *Permit. Palometa.* West Indies, north to Florida and Lower California. Instead of the synonymy in the synopsis read: *Trachynotusrhodopus* (young) and *T. nasutus* (very young) Gill, Proc. Ac. Nat. Sci. Phila., 1863, 85; *Trachynotus goreensis* Günther, II, 483, in part, not of Cuv. & Val.; *Trachynotus goreensis* of recent American writers; *Trachynotus carolinus* Poey, Enum. Pisc. Cubens., 86.This species reaches a larger size than the others in our waters. It has fewer fin rays than *T. carolinus*, and young and old are much more elongate than in *T. rhombooides* or than in the African *T. goreensis*.<sup>5</sup> *Trachynotus kennedyi* Steindachner, Ichth. Beitr., VI, 47. Mazatlan to Panama.<sup>6</sup> *Trachynotus fasciatus* Gill, Proc. Ac. Nat. Sci. Phila. 1863, 86. Mazatlan to Panama.<sup>7</sup> *Seriola dumérili* Risso. *Amber Jack.*Grayish; silvery below; a gilt band through eye to base of caudal; another through temporal region to front of soft dorsal; no dark cross-bands; fins plain. Very close to *S. lalandi*, but reaching a smaller size, and with the body deeper and little com-

806. *Seriola mazatlanai* Steindachner. P.  
 807. *Seriola dorsalis* Gill. C. P. (701)  
 808. *Seriola fasciata* Bloch. S. (705)  
 809. *Seriola rivoliana* Cuv. & Val. S. W. Eu. (702, 702 b.)

**254.—ELAGATIS** Bennett. (228)

810. *Elagatis pinnulatus* Poey. W. (706)

**255.—NEMATISTIUS<sup>2</sup>** Gill.

811. *Nematistius pectoralis* Gill. P.

**256.—OLIGOPLITES** Gill. (229)

812. *Oligoplites altus<sup>3</sup>* Günther. P.  
 813. *Oligoplites saurus* Bloch & Schneider. S. W. P. (707)

Family LXXXVI.—POMATOMIDÆ. (76)

**257.—POMATOMUS** Lacépède. (230)

814. *Pomatomus saltatrix* Linnaeus. N. S. W. Eu. O. (708)

Family LXXXVII.—NAMEIDÆ. (76 b.)

**258.—NAMEUS** Cuvier. (231)

815. *Nameus gronovii* Gmelin. W. O. (709)

Family LXXXVIII.—STROMATEIDÆ. (77)

**259.—STROMATEUS** Linnaeus. (232)

§ *Rhombus* Lacépède.

816. *Stromateus paru* Linnaeus. S. W. (710)

pressed; mouth larger than in *S. dorsalis*, about as in *S. lalandi*; the maxillary reaching middle of pupil,  $2\frac{1}{2}$  in head. Lobes of dorsal and anal low, not quite half length of head. Nape scarcely carinated. Head  $3\frac{1}{2}$ ; depth 3. D. VII-I, 32; A. II-I, 21; L. 24 inches. Mediterranean to West Indies, north to Key West and Pensacola.

(*Traelurus aliciulus* Rafinesque Caratteri, etc., 1810, 42; *Trachurus fasciatus* Rafinesque, Indice d'Ittiologia Sicil., 1810, 21; *Caranx dumérili* Riso, Ichthyologie Nice, 1810, 175; *Seriola dumérili* Cuv. & Val., IX, 201, 1833; Günther, II, 462; ? *Seriola semicorona* Poey, Memorias Cuba, II, 1860, 232.)

An analysis of the characters of the species of *Seriola* is given by me in Proc. U. S. Nat. Mus., 1884, 123. A more recent (unpublished) study of these fishes by Mr. Rufus L. Green indicates the probable identity of *S. lalandi* with *S. aliciula* (*dumérili*), *S. falcata* with *S. rivoliana*, and (probably) *S. mazatlanica* with *S. dorsalis*.

<sup>1</sup> *Seriola mazatlanica* Steindachner, Ichth. Beiträge, V. 8, 1876. Mazatlan.

<sup>2</sup> *NEMATISTIUS* Gill.

(Gill, Proc. Ac. Nat. Sci. Phila., 1862, 258; type, *Nematistius pectoralis* Gill).

This genus differs from *Seriola* chiefly in the development of the spinous dorsal and pectoral fins, the former being composed of eight very long filamentous spines, the latter being acuminate and nearly twice as long as the ventrals. The lateral line is nearly straight and is not keeled on the caudal peduncle. Ventral rays, I, 5, the inner ray much branched to the base. One species known. Large fishes of an imposing appearance.

*Nematistius pectoralis* Gill, l. e. Gulf of California to Panama; not rare.

<sup>3</sup> *Chorinemus altus* Günther, Fishes Centr. Amer., 1869, 433. Mazatlan to Panama.

§ *Stromateus*.

- 817. Stromateus medius**<sup>1</sup> Peters. P.  
**818. Stromateus simillimus** Ayres. C. (711)

§ *Poronotus*.

- 819. Stromateus triacanthus** Peck. N. (712)

**260.—LEIRUS** Lowe. (233)

- 820. Leirus perciformis** Mitchell. N. (713)

## Family LXXXIX.—LAMPRIDIDÆ. (78)

**261.—LAMPRIS** Retzius. (234)

- 821. Lampris guttatus** Brünnich. O. (714)

## Family XC.—CORYPHÆNIDÆ. (79)

**262.—CORYPHÆNA** Linnæus. (235.)

- 822. Coryphaena hippurus**<sup>2</sup> Linnaeus. O. S. W. (715, 716)

## Family XCI.—BRAMIDÆ. (80)

**263.—PTERACLIS** Gronow. (236)

- 823. Pteraclis carolinus** Cuv. & Val. O. (717)

**264.—BRAMA** Bloch & Schneider. (236 b.)

- 824. Brama raji** Bloch. C. N. Eu. O. (717 b.)

Family XCII.—ICOSTEIDÆ.<sup>3</sup> (101)**265.—ICOSTEUS** Lockington. (332)

- 825. Icosteus ænigmaticus** Lockington. B. C. (969)

**266.—ICICHTHYS** Jordan & Gilbert. (333)

- 826. Icichthys lockingtoni** Jordan & Gilbert. B. C. (970)

<sup>1</sup> *Stromateus medius* Peters, Berliner Monatsberichte, 1869, 707; Jordan, Proc. Ac. Nat. Sci. Phila., 1883, 284.

<sup>2</sup> *Coryphaena equisetis* has not been authentically recorded from our coasts. It may, therefore, be omitted. The common Dolphin or Dorado of our South Atlantic and Gulf coasts is *Coryphaena hippurus* L.

This species is in life of a very bright greenish olive, with small round blue spots. The top of the head in the males is much elevated, forming a high sharp crest. Head  $4\frac{2}{3}$ ; depth 5; ventral inserted slightly behind upper ray of pectoral, its length  $1\frac{1}{2}$  in in head; pectoral  $1\frac{1}{2}$ . D. 59 to 63; A. 29. Pelagic, north on our coast to Cape Cod; very abundant from South Carolina to Texas. L. 3 to 5 feet. The specific names *punctulata*, *globiceps*, *sueuri*, *dorado*, *guttata*, and *punctata* all belong to this species.

<sup>3</sup> The position of our family ICOSTEIDÆ is near or under the family BRAMIDÆ, as has been shown by Dr. Steindachner, Ichth. Beitr. XII, 22. The genus *Balkymaster* is apparently not a natural ally of *Icosteus*.

## Family XCIII.—ZENIDÆ. (81)

267.—**ZENOPSIS** Gill. (237)827. *Zenopsis ocellatus* Storer. B. (718)

## Family XCIV.—BERYCIDÆ. (82)

268.—**STEPHANOBERYX**<sup>1</sup> Gill.828. *Stephanoberyx monæ* Gill. B.269.—**CAULOLEPIS**<sup>2</sup> Gill.829. *Caulolepis longidens* Gill. B.270.—**PLECTROMUS**<sup>3</sup> Gill.830. *Plectromus suborbitalis* Gill. B.831. *Plectromus crassiceps* Bean. B.<sup>1</sup> **STEPHANOBERYX** Gill.(Gill, Proc. U. S. Nat. Mus., 1883, 258; type *Stephanoberyx monæ* Gill.)

"Berycids with an elongated claviform contour, body covered with cycloid scales; scarcely imbricated, and armed about the center with one or two erect spines; an oblong head, with a moderate convex snout and with thin osseous ridges, especially an inner V-shaped one on the crown, whose limbs diverge on each side of nape, and an outer sigmoid, one on each side, above the eyes, and continuous with one projecting from the nasal; the inner and outer ridges connected by a cross-bar on a line with the anterior margin of the orbit; rather small eyes, in the anterior half of the head, and the teeth small, acute, and in a band on the premaxillaries and dentaries (palate toothless), and with ventrals having one spine and five rays. Closely allied to *Melamphaës*."

*Deeps sea.* ( $\Sigma\tau\varepsilon\varphi\alpha\nu\sigma$ , crown;  $\beta\eta\rho\nu\xi$ , beryx.)*Stephanoberyx monæ* Gill. Gulf stream, latitude 41°. (Gill, l. c. 258.)<sup>2</sup> **CAULOLEPIS** Gill.(Gill, Proc. U. S. Nat. Mus., 1883, 258; type *Caulolepis longidens* Gill.)

"Berycids with a laterally oval or broad pyriform contour; a compressed body, covered with small, pedunculated, leaf-like scales; an abruptly declivous forehead; small eyes: a pair of very long pointed teeth in front of upper jaw, closing in front of lower; a similar pair of still longer teeth in the lower, received in foveæ of the palate; on the sides of each jaw two long teeth, terminating in bulbous tips; a row of minute teeth on the posterior half of the maxillaries. Closely allied to *Anoplogaster*." Deep sea. ( $Kαυλος$ , stem;  $\lambdaεπις$ , scale.)

*Caulolepis longidens* Gill. Deep sea; latitude 39°. (Gill, l. c. 258.)<sup>3</sup> **PLECTROMUS** Gill.(Gill, Proc. U. S. Nat. Mus., 1883, 257; type *Plectromus suborbitalis* Gill.)

"Berycids with an elongated form; moderate cycloid scales; an oblong head with a much decurved or truncate snout; rather small eyes, and teeth small, acute and in two rows in each jaw, of which those of the minor row, at least in the lower jaw, are largest, and palate toothless." Deep sea. ( $\Pi\lambda\hat{\eta}\pi\tau\rho\omega\tau$ , spur;  $\omega\mu\oslash$ , shoulder); "two spines, one on each side of the nape, springing forward from the shoulder bones, give a strange appearance to the fish."

*Plectromus suborbitalis* Gill. Gulf Stream, latitude 39°. (Gill, l. c., 257.)*Plectromus crassiceps* Bean. Proc. U. S. Nat. Mus., 1885, 73. Gulf Stream.

271.—**POROMITRA**<sup>1</sup> Goode & Bean.832. **Poromitra capito** Goode & Bean. B.272.—**HOPLOSTETHUS** Cuv. & Val. (238)833. **Hoplostethus mediterraneus** Cuv. & Val. B. En. (719)Family XCV.—**HOLOCENTRIDÆ**.<sup>2</sup>273.—**HOLOCENTRUM** Bloch. (239)834. **Holocentrum ascensione**<sup>3</sup> Osbeck. W. (720)835. **Holocentrum suborbitale**<sup>4</sup> Gill. P.274.—**MYRIPRISTIS**<sup>5</sup> Cuv.836. **Myripristis occidentalis** Gill. P.837. **Myripristis pœcilonotus** Gill. P.<sup>1</sup>**POROMITRA** Goode & Bean.

(Goode & Bean, Bull. Mus. Comp. Zool., 1882, 215; type, *Poromitra capito* G. & B.).  
 Body short, compressed, seopeliform, covered with thin cycloid scales. Head very large (in young specimens nearly as long as trunk), its sides scaly. No barbel. Mouth very large, the lower jaw projecting. Margin of upper jaw composed of a long maxillary and a short premaxillary. Teeth very small, cardiform, on premaxillaries and lower jaw only. Opercula complete. Dorsal fin in middle of body, its origin not far behind ventrals, its spinous and soft portions about equal in length; anal much shorter than dorsal; the last rays of dorsal nearly above its middle. Pseudobranchiaæ present. Gill openings very wide. Deep seas. (*Πορος*, pore; *μύρια*, stomacher.)

*Poromitra capito* Goode & Bean.

Eye large, as long as snout; maxillary  $3\frac{1}{2}$  in head. Scales as large as pupil, with concentric striae. Insertion of dorsal midway between tip of snout and base of caudal; base of anal half that of dorsal; pectoral inserted low, its length twice its distance from the snout; ventrals minute, in advance of pectorals. Caudal (mutilated in the known specimens). Head  $2\frac{1}{2}$  (in young). D. VII or VIII, 9; A. 9; V. 7 or 8; P. 12. Gulf Stream in lat.  $34^{\circ}$ . (Goode & Bean.)

(Goode & Bean, l. c., 214, 1882).

<sup>2</sup>The genera *Holocentrum* and *Myripristis*, shore fishes with long spinous dorsal, should probably be regarded as forming a family distinct from the *Berycidae*, which are deep-sea fishes with a single dorsal, provided with but few spines, or even with none.

<sup>3</sup>This species, called in the text *Holocentrum pentacanthum*, should apparently stand as *Holocentrum ascensione* (Osbeck). In life, an oblique white bar descends backward from the eye; this disappears entirely in spirits. To the synonymy, add: (*Percæ ascensionis* Osbeck, Iter Chin., 1771, 388; *Percæ ascensionis* Gmelin, Syst. Nat., 1788, 131<sup>s</sup>; *Amphiprion matejuelo* Bloch & Schneider, Ichthyol., 1801, 206; *Holocentrum matejuelo* Poey, Memorias Cuba, II, 155, 1860.)

<sup>4</sup>*Holocentrum suborbitale* Gill, Proc. Ac. Nat. Sci. Phila., 1863, 86. Mazatlan to Panama. Abundant in rock-pools.

<sup>5</sup>**MYRIPRISTIS** Cuv.

(Cuvier, Règne Animal; type *Myripristis jacobus* Cuv. & Val.)

This genus is very closely related to *Holocentrum*, differing externally, chiefly in the absence of the large spine at the angle of the preopercle. The air-bladder is divided into two parts by a transverse constriction, and the pyloric cœca are rather

## Family XCVI.—APHREDODERIDÆ. (83)

275.—**APHREDODERUS** Le Sueur. (240)838. *Aphredoderus sayanus* Gilliams. (721)

## Family XCVII.—ELASSOMIDÆ. (83b)

276.—**ELASSOMA** Jordan (722)839. *Elassoma zonatum* Jordan. Vs. (722)840. *Elassoma evergladei*<sup>1</sup> Jordan. Vse.

## Family XCVIII.—CENTRARCHIDÆ. (84)

277.—**CENTRARCHUS** Cuv. & Val. (242)841. *Centrarchus macropterus* Lacépède. Vs. (723)278.—**POMOXYS** Rafinesque. (243)842. *Pomoxys annularis* Rafinesque. V. (724)843. *Pomoxys sparoides* Lacépède. V. (725)279.—**ARCHOPLITES** Gill. (244)844. *Archoplites interruptus* Girard. T. (726)280.—**AMBLOPLITES** Rafinesque. (245)845. *Ambloplites rupestris* Rafinesque. V. (727)281.—**CHÆNOBRYTTUS** Gill. (246)846. *Chænobryttus gulosus* Cuv. & Val. V. (729)846b. *Chænobryttus gulosus antistius* McKay. Vn. (728)282.—**ACANTHARCHUS** Gill. (247)847. *Acantharchus pomotis* Baird. Ve. (736)283.—**ENNEACANTHUS** Gill.848. *Enneacanthus eriarchus* Jordan. Vn. (731)849. *Enneacanthus obesus* Baird. Ve. (732)850. *Enneacanthus gloriosus* Holbrook. Vse. (733)851. *Enneacanthus simulans* Cope. Ve. (734)851b. *Enneacanthus simulans pinniger* Gill & Jordan. Vse.284.—**MESOGONISTIUS** Gill.852. *Mesogonistius chaetodon* Baird. Ve. (735)

few (9). Species numerous in the tropical seas ; gay-colored inhabitants of reefs and rock-pools.

*Myripristis occidentalis* Gill, Proc. Ac. Nat. Sci. Phila., 1863, 87 = *Rhamphoberyx leucopus* Gill, I. e., 88. Gulf of California to Panama.

*Myripristis pacilopus* Gill. *Rhamphoberyx pacilopus* Gill, I. e., 87; see Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 364. Cape San Lucas; perhaps identical with the preceding.

<sup>1</sup> *Elassoma evergladei* Jordan, Proc. U. S. Nat. Mus., 1884, 323. Indian, Saint John's and Suwannee Rivers, Florida.

285.—**LEPOMIS** Rafinesque. (250)§ *Apomotis* Rafinesque.

853. *Lepomis cyanellus* Rafinesque. V. (736)  
 854. *Lepomis symmetricus* Forbes. Vs. (737)  
 855. *Lepomis phenax* Cope & Jordan. Ve. (738)
- § *Lepomis*.
856. *Lepomis ischyurus* Jordan & Nelson. Vnw. (739)  
 857. *Lepomis macrochirus* Rafinesque. Vw. (740)  
 858. *Lepomis mystacalis* Cope. Vse. (741)  
 859. *Lepomis elongatus* Holbrook. Vse. (742)  
 860. *Lepomis murinus* Girard. Vsw. (743)  
 861. *Lepomis punctatus* Cuv. & Val. Vse. (744)  
 862. *Lepomis miniatus* Jordan. Vs. (745)  
 863. *Lepomis auritus* Linnaeus. Ve. (746)  
 864. *Lepomis megalotis*<sup>1</sup> Rafinesque. Vw. (747, 749)  
 865. *Lepomis garmani* Forbes. Vw.  
 866. *Lepomis marginatus* Holbrook. Vse. (748)  
 867. *Lepomis aquilensis*<sup>2</sup> Baird & Girard. Vsw.  
 868. *Lepomis humilis* Girard. Vsw. (750)  
 869. *Lepomis pallidus* Mitchell. V. (751)

§ *Xystroplites* Jordan.

870. *Lepomis heros* Baird & Girard. Vsw. (752)  
 871. *Lepomis euryorus* McKay. Vn. (753)  
 872. *Lepomis albulus* Girard. Vsw. (754)

§ *Eupomotis* Gill & Jordan.

873. *Lepomis holbrooki* Cuv. & Val. Vse. (755)  
 674. *Lepomis notatus* Agassiz. Vs. (756)  
 875. *Lepomis gibbosus* Linnaeus.<sup>3</sup> Vne. (757)

286.—**MICROPTERUS** Lacépède. (251)

876. *Micropterus salmoides* Lacépède. V. (759)  
 877. *Micropterus dolomiei* Lacépède. V. (760.)

## Family XCIX.—PERCIDÆ. (85)

287.—**AMMOCRYPTA** Jordan. (252)

878. *Ammocrypta beani* Jordan. Vs. (761)  
 879. *Ammocrypta clara*<sup>4</sup> Jordan & Meek. Vw.  
 880. *Ammocrypta pellucida* Baird. Vw. (762)  
 881. *Ammocrypta vivax* Hay. Vsw. (762b.)

<sup>1</sup> *Lepomis bombifrons* is omitted, as being probably based on a form of *L. megalotis*.

<sup>2</sup> *Lepomis aquilensis* (*Pomotis aquileensis* Baird & Girard, Proc. Ac. Nat. Sci. Phila. 1854, 24), placed in the Synopsis as a synonym of *L. pallidus*, is a valid species. It is closely related to *L. megalotis*, but has much higher spines, and a long and very narrow opercular flap; a dusky patch on base of last rays of dorsal.

<sup>3</sup> *Lepomis lirus* McKay—*Pomotis pallidus* Agassiz is here omitted. Agassiz's very poor description applies well enough to *Chænobrytus gulosus*.

<sup>4</sup> *Ammocrypta clara* Jordan & Meek, Proc. U. S. Nat. Mus., 1884. Des Moines R., Iowa, and Red R., Arkansas.

288.—CRYSTALLARIA<sup>1</sup> Jordan & Gilbert.882. *Crystallaria asprella* Jordan. Vs. (763)

## 289.—IOA Jordan &amp; Brayton. (253)

883. *Ioa vitrea* Cope. Vse. (764)884. *Ioa vigilis* Hay. Vs. (764b.)

## 290.—BOLEOSOMA De Kay. (254, 255)

885. *Boleosoma olmstedi* Storer. Vne. (765)885b. *Boleosoma olmstedi atramaculatum* Girard. (Ve.)885c. *Boleosoma olmstedi effulgens* Girard. (Vse.) (767)885d. *Boleosoma olmstedi maculatum*<sup>2</sup> Agassiz. Vw. (766)885e. *Boleosoma olmstedi ozarcanum*<sup>3</sup> Jordan & Gilbert. Vsw.885f. *Boleosoma olmstedi mesaeum* Cope. Vw. .885g. *Boleosoma olmstedi wsopus* Cope. Ve. (760)886. *Boleosoma vexillare* Jordan. Ve. (768)887. *Boleosoma susanæ*<sup>4</sup> Jordan & Swain. Vs.888. *Boleosoma camurum* Forbes. Vw. (770, 771)291.—ULOCENTRA<sup>5</sup> Jordan. (256)889. *Ulocentra phlox* Cope. Vsw. (772)890. *Ulocentra stigmæa* Jordan. Vs. (773)891. *Ulocentra simotera* Cope. Vs. (774, 775)892. *Ulocentra histrio*<sup>6</sup> Jordan & Gilbert. Vsw.893. *Ulocentra blennius*<sup>7</sup> Gilbert & Swain. Vs.

## 292.—DIPLESION Rafinesque. (257)

894. *Diplesion blennioides* Rafinesque. Vw. (776)

## 293.—COTTOGASTER Putnam. (258)

895. *Cottogaster copelandi* Jordan Vw. (777)896. *Cottogaster putnami* Jordan & Gilbert. Vw. (778)<sup>1</sup> CRYSTALLARIA Jordan & Gilbert.(Genus nova; type *Pleurolepis asprellus* Jordan.)This genus differs from *Ammoerypta* chiefly in having the premaxillaries non-protractile. The vertical fins are much more developed than in the latter genus, there being 14 dorsal spines, and 12 soft rays in the anal fin. The squamation is much more complete than in *Ammoerypta*, but the body is similarly hyaline. (*Κρυσταλλίος*, crystal.)<sup>2</sup> I adopt the name *maculatum* for this species or subspecies, the identification of Rafinesque's *Etheostoma nigra* with it being very doubtful. *Pacilichthys beani* Jordan, Proc. U. S. Nat. Mus., 1884, is identical with *B. maculatum*.<sup>3</sup> *Boleosoma olmstedi ozarcanum* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1885. Ozark region.<sup>4</sup> *Boleosoma susana* Jordan & Swain, Proc. U. S. Nat. Mus., 1883, 248. Cumberland R., Kentucky.<sup>5</sup> *Ulocentra atripinnis* Jordan is the adult of *Diplesion simoterum*.<sup>6</sup> *Etheostoma histrio* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1885. Streams of Arkansas.<sup>7</sup> *Etheostoma blennius* Gilbert & Swain, Proc. U. S. Nat. Mus., 1884. Streams of Northern Alabama.

897. *Cottogaster uranidea*<sup>1</sup> Jordan & Gilbert. Vw.898. *Cottogaster shumardi* Girard. Vsw. (770)294.—**PERCINA** Haldeman. (260)899. *Percina caprodes* Ratinquesque. V. (789)899b. *Percina caprodes zebra*<sup>2</sup> Agassiz. Vn.295.—**HADROPTERUS** Agassiz. (261, 262)§ *Alvordius* Girard.900. **Hadropterus macrocephalus** Cope. Vne. (781)901. **Hadropterus phoxocephalus** Nelson. Vw. (782)902. **Hadropterus aspro** Cope & Jordan. Vw. (783)903. **Hadropterus ouachitæ**<sup>3</sup> Jordan & Gilbert. Vsw.904. **Hadropterus peltatus**<sup>4</sup> Stauffer. Ve. (784, 785, 786)§ *Ericosma* Jordan.905. **Hadropterus evides** Jordan & Copeland. Vw. (787)906. **Hadropterus fasciatus** Girard. Vsw. (788)§ *Hadropterus*.907. **Hadropterus nigrofasciatus** Agassiz. Vs. (790)908. **Hadropterus aurantiacus** Cope. Vs. (789)909. **Hadropterus squamatus**<sup>5</sup> Gilbert & Swain. Vs.910. **Hadropterus cymatotænia**<sup>6</sup> Gilbert & Meek. Vw.911. **Hadropterus nianguæ**<sup>7</sup> Gilbert & Meek. Vw.912. **Hadropterus variatus** Kirtland. Vw. (801)§ *Serraria* Gilbert.913. **Hadropterus scierus**<sup>8</sup> Swain. Vsw.

§ — ?

914. **Hadropterus ? tessellatus** Storer. Vs. (796)915. **Hadropterus ? cinereus** Storer. Vs. (797)<sup>1</sup> *Cottogaster uranidea* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1885. Washita River, Arkansas.<sup>2</sup> *Pileoma zebra* Agassiz, Lake Superior, = *Percina manitou* Jordan.<sup>3</sup> *Hadropterus ouachitæ* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1885. Saline River, Arkansas.<sup>4</sup> *Hadropterus maculatus* Girard = *Etheostoma peltatum* Stauffer = *Etheostoma nevisense* Cope = *Alvordius crassus* Jordan & Brayton = *Alvordius variatus* Auet. (not *Alvordius maculatus* Girard, nor *Etheostoma variatum* Kirtland).<sup>5</sup> *Hadropterus squamatus* Gilbert & Swain, Proc. U. S. Nat. Mus., 1885. Tennessee Basin.<sup>6</sup> *Hadropterus cymatotænia* Gilbert & Meek, Proc. U. S. Nat. Mus., 1885. Ozark region of Missouri.<sup>7</sup> *Hadropterus nianguæ* Gilbert, & Meek Proc. U. S. Nat. Mus., 1885. Niangua River, Southern Missouri.<sup>8</sup> *Hadropterus scierus* Swain. Proc. U. S. Nat. Mus., 1883, 352. Southern Indiana and southwestward; very abundant in streams of Arkansas and Texas. This species is made the type of a genus, *Serraria*, by Gilbert (Proc. U. S. Nat. Mus., 1884), distinguished from *Hadropterus* by the serrulate preopercle.

296.—**ETHEOSTOMA** Rafinesque. (263, 264, 265, 266)

§ *Rhothaea*<sup>1</sup> Jordan.

916. **Etheostoma zonale** Cope. Vw. (798)  
 916b. *Etheostoma zonale arcansanum*<sup>2</sup> Jordan & Gilbert. Vsw.  
 917. **Etheostoma lynceum**<sup>3</sup> Hay. Vs. (799)  
 918. **Etheostoma thalassinum** Jordan & Brayton. Vse. (800)  
 919. **Etheostoma inscriptum** Jordan & Brayton. Vse. (802)

§ *Nothonotus* Agassiz. (263)

920. **Etheostoma camurum**<sup>4</sup> Cope. Ve. (791, 795)  
 921. **Etheostoma maculatum**<sup>5</sup> Kirtland. Ve. (792, 793)  
 922. **Etheostoma rufolineatum** Cope. Vs. (794)

§ *Etheostoma*.

923. **Etheostoma flabellare** Rafinesque. V. (804)  
 923b. *Etheostoma flabellare*<sup>6</sup> *cumberlandicum* Jordan & Swain. Vs.  
 923c. *Etheostoma flabellare lineolatum* Agassiz. Vuw. (803)  
 924. **Etheostoma artesiae** Hay. Vs. (809)  
 925. **Etheostoma squamiceps** Jordan. S. (805)

§ *Pacilichthys* Agassiz.

926. **Etheostoma virgatum** Jordan. Ve. (806)  
 927. **Etheostoma sagitta**<sup>7</sup> Jordan & Swain. Ve.  
 928. **Etheostoma saxatile** Hay. Vs. (807)  
 929. **Etheostoma rupestre**<sup>8</sup> Gilbert & Swain. Vs.  
 930. **Etheostoma luteovinctum**<sup>9</sup> Gilbert & Swain. Vs.  
 931. **Etheostoma parvipinne**<sup>10</sup> Gilbert & Swain. Vs.  
 932. **Etheostoma boreale**<sup>11</sup> Jordan. Vne.  
 933. **Etheostoma punctulatum**<sup>12</sup> Agassiz. Vw.

<sup>1</sup> *Rhothaea* Jordan subgenus nova; type *Pacilichthys zonalis* Cope; substitute for *Nanostoma* Putnam; preoccupied by *Naunostomus* Günther, a genus of Characidae (*ρόθης*, a current; *οιχεω*, to inhabit.) I here regard *Pacilichthys*, *Nothonotus*, and *Rhothaea* as subgenera under *Etheostoma*.

<sup>2</sup> *Etheostoma zonale arcansanum* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1885. Arkansas and southward.

<sup>3</sup> *Etheostoma lynceum* Hay, nom. sp. nov. for *Nanostoma elegans* Hay; not *Boleichthys elegans* Girard.

<sup>4</sup> *Pacilichthys camurus* Cope = *Pacilichthys vulneratus* Cope.

<sup>5</sup> *Etheostoma maculatum* Kirtland = *Pacilichthys sanguifluus* Cope.

<sup>6</sup> *Etheostoma cumberlandicum* Jordan & Swain, Proc. U. S. Nat. Mus., 1883, 251. Cumberland River.

<sup>7</sup> *Pacilichthys sagitta* Jordan & Swain, Proc. U. S. Nat. Mus., 1883, 250. Cumberland River.

<sup>8</sup> *Etheostoma rupestre* Gilbert & Swain, Proc. U. S. Nat. Mus., 1885. Tennessee Basin.

<sup>9</sup> *Etheostoma luteovinctum* Gilbert & Swain, Proc. U. S. Nat. Mus., 1885. Northern Alabama.

<sup>10</sup> *Etheostoma parvipinne* Gilbert & Swain, Proc. U. S. Nat. Mus., 1885. Northern Alabama.

<sup>11</sup> *Pacilichthys borealis* Jordan, Proc. U. S. Nat. Mus., 1884. Montreal.

<sup>12</sup> This is not the species described as *Pacilichthys punctulatus* in the Synopsis. For description, see Gilbert & Meek, Proc. U. S. Nat. Mus., 1885. Osage River.

934. *Etheostoma whipplei*<sup>1</sup> Girard. Vsw. (808)  
 935. *Etheostoma lepidum* Baird & Girard. Vsw. (810)  
 936. *Etheostoma cœruleum* Storer. Ve. (811)  
 936b. *Etheostoma cœruleum spectabile* Agassiz. Vw. (812)  
 937. *Etheostoma jessiae*<sup>2</sup> Jordan & Brayton. Vw. (814)  
 938. *Etheostoma iowæ* Jordan & Meek. Vnw.

§ ——.

939. *Etheostoma tuscumbia*<sup>3</sup> Gilbert & Swain. Vs.

*Boleichthys* Girard.

940. *Etheostoma quiescens*<sup>4</sup> Jordan. Vse.  
 941. *Etheostoma fusiforme*<sup>5</sup> Girard. V. (815, 816, 817, 818, 819, 822)  
 941b. *Etheostoma fusiforme eos* Jordan & Copeland. Vnw. (819)  
 942. *Etheostoma exile*<sup>6</sup> Girard. Vnw. (820, 821)

297.—**ALVARIUS** Girard. (267)

943. *Alvarius lateralis* Girard. Vsw. (823)  
 944. *Alvarius præliaris* Hay. Vs. (824)  
 945. *Alvarius punctulatus* Putnam. Vn. (825)  
 946. *Alvarius fonticola*<sup>7</sup> Jordan & Gilbert. Vsw.

298.—**PERCA** Linnaeus. (268)

947. *Perca lutea* Rafinesque. Vne. (826)

299.—**STIZOSTEDION** Rafinesque. (269)

948. *Stizostedion vitreum* Mitchell. V. (827)  
 949. *Stizostedion canadense* Smith. Vne. (828)  
 949b. *Stizostedion canadense griseum* De Kay. Vn.  
 949c. *Stizostedion canadense boreum* Girard. Vnw.

Family C.—CENTROPOMIDÆ.<sup>8</sup>

300.—**CENTROPOMUS** Lacépède. (270.)

950. *Centropomus undecimalis* Bloch. W. P. (879)

<sup>1</sup> This is *P. punctulatus* of the Synopsis, not of Agassiz. It is readily distinguished from the preceding by its slenderer form, larger scales, and less speckled coloration. In life it is spotted with bright red. See Gilbert, l. c.

<sup>2</sup> *Pacilichthys jessiae* Jordan & Brayton = *Pacilichthys asprigenis* Forbes = *Pacilichthys swaini* Jordan, Proc. U. S. Nat. Mus., 1884, 479. The lateral line in this species is sometimes complete.

<sup>3</sup> *Etheostoma tuscumbia* Gilbert & Swain, Proc. U. S. Nat. Mus., 1885. Tuscumbia Spring, Alabama.

<sup>4</sup> *Pacilichthys quiescens* Jordan, Proc. U. S. Nat. Mus., 1884, 478. Suwannee River, Georgia.

<sup>5</sup> *Boleosoma fusiformis* Girard = *Boleosoma barratti* Holbrook = *Hololepis erochrous* Cope = *Boleosoma gracile* Girard = *Pacilichthys butleri* Hay = *Pacilichthys palustris* Gilbert, Proc. U. S. Nat. Mus., 1884, 209. *Pacilichthys eos* seems also to represent a slight variety of this widely diffused species.

<sup>6</sup> *Boleichthys warreni* is doubtless identical with *Etheostoma exile*. The types of the former are lost.

<sup>7</sup> *Microperea fonticola* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1885. San Marco Spring, Texas. *Alvarius* and *Microperea* are probably identical.

<sup>8</sup> The characters of the family of *Centropomidae* are given in detail by Prof. Gill, Proc. U. S. Nat. Mus., 1882, 484.

951. *Centropomus nigrescens*<sup>1</sup> Günther. P.  
 952. *Centropomus pedimacula*<sup>2</sup> Poey. P. W.  
 953. *Centropomus robalito*<sup>3</sup> Jordan & Gilbert. P.

Family Cl.—SERRANIDÆ. (86)

301.—**ROCCUS** Mitchell. (271)

§ *Roccus*.

954. *Roccus septentrionalis*<sup>4</sup> Bloch & Schneider. N. S. Ana. (830)  
 955. *Roccus chrysops* Rafinesque. Vw. (831)

§ *Morone* (Mitchell) Gill.

956. *Roccus interruptus* Gill. Vsw. (832)  
 957. *Roccus americanus* Gmelin. N. Ana. (833)

302.—**SERRANUS** Cuvier. (274)

§ *Centropristes* Cuvier.

958. *Serranus atrarius* Linnaeus. S. (836)  
 959. *Serranus furvus* Walbaum.<sup>5</sup> N. (836 b.)  
 960. *Serranus philadelphicus*<sup>6</sup> Linnaeus. S. (837)

§ *Diplectrum* Holbrook.

961. *Serranus formosus* Linnaeus. S. W. (838)  
 962. *Serranus radialis*<sup>7</sup> Quoy & Gaimard. P. W.

§ *Prionodes* Jenyns.

963. *Serranus subligarius* Cope. W. (839)  
 964. *Serranus phœbe*<sup>8</sup> Poey. W.

<sup>1</sup> *Centropomus nigrescens* Günther, Proc. Zoöl. Soc. London, 1864, 144; Günther, Fishes Centr. Amer., 1869, 407. Mazatlan to Panama.

<sup>2</sup> *Centropomus pedimacula* Poey, Memorias Cuba, II, 1860, 122= *Centropomus medius* Günther, Fish. Centr. Amer., 1869, 406. Both coasts of tropical America, north to Mazatlan.

<sup>3</sup> *Centropomus robalito* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1881, 462. Mazatlan.

<sup>4</sup> This species should stand as above, instead of *Roccus lineatus*. The original *Sciæna lineata* of Bloch was probably one of the European species. To the synonymy add *Perca saxatilis* and *Perca septentrionalis* Bloch & Schneider, Syst. Nat., 1801, 89, 90. *Perca saxatilis* is preoccupied.

<sup>5</sup> *Perca furva* Walbaum, Artedi Piscinm, 1279= *Coryphaena nigrescens* Bloch & Schneider, 1801.

<sup>6</sup> *Perca philadelphica* Linnaeus, Syst. Nat. X, 291, 1758=ed. XII, 1766, 484= *Perca trifurca* Linnaeus, Syst. Nat., ed. XII, 489, 1766.

<sup>7</sup> *Serranus radialis* Quoy & Gaimard, Voyage Freycinet, 316= *Centropristes radialis* Günther, I, 83= *Centropristes macropoma* Günther, Fish. Centr. Amer., 1869, 409. Coast of Brazil and west coast of tropical America, north to Gulf of California.

<sup>8</sup> *Serranus phœbe* Poey.

Light brownish, paler below; a sharply defined white bar extending upward from before vent about to middle of side, its width rather more than diameter of pupil; before this a broad dusky shade extending downward from back; a vaguely defined quadrate paler area below middle of dorsal and another on back of tail; head and fins without sharp markings. Body oblong, the back little elevated, the head large and not sharp

965. *Serranus calopteryx*<sup>1</sup> Jordan & Gilbert. P.§ *Paralabrax* Girard.966. *Serranus clathratus* Girard. C. (840)967. *Serranus maculofasciatus* Steindachner. C. P. (841)968. *Serranus nebulifer* Girard. C. (842)303.—**HYPPOLECTRUS** Gill. (274 b.)969. *Hypoplectrus nigricans* Poey. W. (843)970. *Hypoplectrus gemma*<sup>2</sup> Goode & Bean. W.304.—**ANTHIAS**<sup>3</sup> Bloch.971. *Anthias multifasciatus* Gill. P.972. *Anthias vivanus*<sup>4</sup> Jordan. W.305.—**PARANTHIAS** Guichenot. (273 b.)973. *Paranthias furcifer* Cuv. & Val. W. P. (835 b.)306.—**POLYPRION** Cuvier.974. *Polypyron americanus*<sup>5</sup> Bloch & Schneider. Acc. B. Eu. (835)307.—**STEREOLEPIS** Ayres.975. *Stereolepis gigas* Ayres. C. (834)

in profile, much less slender than in *S. subligarius*. Teeth moderate, those on sides of lower jaw and front of upper largest; mouth moderate, the maxillary reaching to center of pupil,  $2\frac{1}{2}$  in head; lower jaw projecting; snout  $3\frac{2}{3}$  in head; eye large,  $3\frac{2}{3}$  in head. Scales on cheeks large; preopercle moderately serrate, the teeth nearly uniform; gill-rakers rather short. Caudal moderately forked; dorsal spines rather strong, higher than the soft rays, the longest  $2\frac{1}{3}$  in head; second and third anal spines subequal; pectorals reaching front of anal,  $1\frac{1}{3}$  in head; head  $2\frac{2}{3}$ ; depth  $3\frac{1}{2}$ ; D X, 12, A. III, 7. Scales 5-48-14. L. 8 inches. West Indies, north to Pensacola, Florida.

(Poey, Memorias Cuba, I, 1851, 55; *Centropristes phæbe* Günther, I, 85, 1859; *Hali-perca phæbe* Poey, Enum. Pisc. Cubens., 1875, 22.)

<sup>1</sup> *Prionodes fasciatus* Jenyns, Voyage of the Beagle, Fishes, 1842, 46 = *Serranus calopteryx* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1881, 350. Mazatlan to Galapagos Islands. The name *fasciatus* is preoccupied in this genus.

<sup>2</sup> *Hypoplectrus gemma* Goode & Bean, Proc. U. S. Nat. Mus., 1882, 428. Garden Key, Florida.

<sup>3</sup> *ANTHIAS* Bloch.

(*Pronotogrammus* Gill.)

(Bloch, Ichthyologia, type *Labrus anthias* L. = *Anthias sacer* Bloch.)

This genus is closely allied to *Serranus*, differing technically chiefly in the direction of the lateral line, which runs very high and is concurrent with the back, becoming abruptly straight and horizontal below last rays of dorsal. The body is rather strongly compressed, the snout blunt, the mouth oblique, the maxillary broad and scaly, and some of the fins with produced or filamentous rays, and the caudal generally deeply forked. Species of rather small size, mostly inhabiting deep waters.

*Anthias multifasciatus* = *Pronotogrammus multifasciatus* Gill, Proc. Ac. Nat. Sci. Phila., 1883, 81. Cape San Lucas. See Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 360.

<sup>4</sup> *Anthias vivanus* Jordan, Proc. U. S. Nat. Mus., 1885. Pensacola.

<sup>5</sup> *Amphiprion americanus* Bloch & Schneider, Syst. Ichth., 1801, 25; not *Epinephelus oxygenios* Bloch & Schneider, l. c. 301.

308.—**PROMICROPS**<sup>1</sup> Gill. (277)976. **Promicrops itaiara** Lichtenstein. W. P. (853)309.—**MYCTEROOPERCA**<sup>2</sup> Gill. (275)

977. **Mycterooperca rosacea**<sup>3</sup> Streets. P.  
 978. **Mycterooperca falcata phenax**<sup>4</sup> Jordan & Swain. W.  
 979. **Mycterooperca microlepis** Goode & Bean. W. S. (846)  
 980. **Mycterooperca bonaci**<sup>5</sup> Poey. W.  
 980 b. *Mycterooperca bonaci xanthosticta* Jordan & Swain.  
 981. **Mycterooperca venenosa**<sup>6</sup> Linnaeus. W. (846 b.)

310.—**EPINEPEHELUS** Bloch. (276)

982. **Epinephelus nigritus** Holbrook. S. (850)  
 983. **Epinephelus moric** Cuv. & Val. S. W. (849)  
 984. **Epinephelus striatus** Bloch. W. (850 b.)  
 985. **Epinephelus sellicauda**<sup>7</sup> Gill. P.  
 986. **Epinephelus niveatus** Cuv. & Val. W. Aee. (851)  
 987. **Epinephelus drummond-hayi** Goode & Bean. S. W. (848)  
 988. **Epinephelus apua**<sup>8</sup> Bloch. W. (850 c.)  
 989. **Epinephelus ascensionis**<sup>9</sup> Osbeck. W. (847)  
 990. **Epinephelus analogus**<sup>10</sup> Gill. P.

311.—**ALPHESTES**<sup>11</sup> Bloch & Schneider.991. **Alphestes multiguttatus** Günther. P.<sup>1</sup> *Serranus itaiara* Lichtenstein = *Promicrops guasa* Poey.For an account of the American genera and species of *Epinephelus* and related forms see Jordan & Swain, Proc. U. S. Nat. Mus., 1884, 358. This paper should supersede the very incomplete account given in the Synopsis.<sup>2</sup> *Mycterooperca* Gill, 1863 = *Trisotropis* Gill, 1865.<sup>3</sup> *Epinephelus rosaceus* Streets, Bull. U. S. Nat. Mus., VII, 1877, 51; *M. rosacea* Jordan & Swain, l. e., 361. Gulf of California.<sup>4</sup> *Mycterooperca falcata phenax* Jordan & Swain, l. e. 363. Key West to Pensacola.<sup>5</sup> *Serranus bonaci*, *brunnens*, *avara*, etc., Poey. See Jordan & Swain, l. e. 370. Key West, southward; Var. *xanthosticta* (l. e. 371) at Pensacola.<sup>6</sup> *Perca renenosa* L. = *Serranus petrosus* Poey.<sup>7</sup> *Epinephelus sellicauda* Gill, Proc. Ac. Nat. Sci. Phila., 1862, 250; Jordan & Swain, Proc. U. S. Nat. Mus., 1884, 385.<sup>8</sup> Described in the Synopsis, page 919, under the erroneous name of *Epinephelus guttatus*. See Jordan & Swain, l. e. 389.<sup>9</sup> Described in the Synopsis, page 539, under the name of *Epinephelus capreolus*. See Jordan & Swain, l. e. 391.<sup>10</sup> *Epinephelus analogus* Gill, Proc. Ac. Nat. Sci. Phila., 1863. Jordan & Swain, l. e. 393.<sup>11</sup> **ALPHESTES** Bloch & Schneider.( *Prospinus* Poey.)(Bloch & Schneider, Syst. Ichth., 1801, 236; type, *Epinephelus afer* Bloch.)

This genus includes small species, differing from *Epinephelus* chiefly in the presence of a strong antorse spine on the lower side of the angle of the preopercle. The three known species are American. (*Αλφηστης*, enterprising or greedy; a name applied to some kind of fish which goes in pairs.) *Alphestes multiguttatus* = *Plectropoma multiguttatum* Günther, Proc. Zool. Soc. London, 1866, 600. See Jordan & Swain, l. e. 395. Mazatlan to Panama.

312.—**ENNEACENTRUS**<sup>1</sup> Gill. (276 b.)§ *Petrometopon* Gill.992. *Enneacentrus guttatus*<sup>2</sup> *coronatus* Cuv. & Val. W.§ *Enneacentrus*.993. *Enneacentrus tæniops* Cuv. & Val. W. Ace. (852 b.)994. *Enneacentrus fulvus ruber*<sup>3</sup> Bloch. W.313.—**DERMATOLEPIS**<sup>4</sup> Gill.995. *Dermatolepis punctatus* Gill. P.Family CII.—**RHYPTICIDÆ**.<sup>5</sup>314.—**RHYPTICUS** Cuvier. (279)§ *Rhypticus*.996. *Rhypticus saponaceus*<sup>6</sup> Bloch. W.997. *Rhypticus xanti*<sup>7</sup> Gill. P.

<sup>1</sup> For a statement of the reasons why *Enneacentrus* is preferred to *Bodianus* as the name of this group, see Jordan & Swain, l. c. 397.

<sup>2</sup> *Enneacentrus guttatus* L.; var *coronatus* Cuv. & Val. Key West and southward. For a description of this species see Jordan & Swain, l. c. 398.

<sup>3</sup> The Linnaean name, *Labrus fulvus* (Syst. Nat., X, 1758, 287), has priority for this species. The yellow, red, and brown varieties may stand as *fulvus*, *ruber*, and *punctatus*, respectively. See Jordan & Swain, Proc. U. S. Nat. Mus., 1884, 402.

*Epinephelus fulvus punctatus* Linnaeus. W. (852b)

<sup>4</sup> **DERMATOLEPIS** Gill.( *Lioperca* Gill. )(Gill, Proc. Ac. Nat. Sci. Phila., 1861, 54; type, *Dermatolepis punctatus* Gill.)

Scales all cycloid; canine teeth very small or obsolete; body comparatively deep; head small; soft dorsal, unusually long, of 19 or 20 rays; spines low. Otherwise essentially as in *Epinephelus*. Two species known. ( $\Delta\sigma\mu\alpha$ , skin;  $\lambda\epsilon\pi\tau\varsigma$ , scale.)

*Dermatolepis punctatus* Gill, Proc. Ac. Nat. Sci. Phila., 1861, 54. Jordan & Swain, l. c. 407. Cape San Lucas and adjacent rocky islands.

<sup>5</sup> The genus *Rhypticus*, differing from all other *Serranidae* in the absence of anal spines and in the reduced number (2 to 4) of the dorsal spines, may be regarded as the type of a distinct family.

<sup>6</sup> *Rhypticus saponaceus* Bloch & Schneider.

*Soap-fish; Jabon; Jaboncillo.* Olivaceous brown, without distinct markings, in spirits. Body oblong, the back little arched, the snout rather pointed in profile, mouth moderate, the maxillary extending to beyond the eye,  $2\frac{1}{2}$  in head; eye about equal to snout,  $3\frac{1}{4}$  in head. Opercle with three strong spines, the middle one largest; preopercle with two spines. Head  $3\frac{1}{4}$ ; depth  $3\frac{1}{4}$ . D. III, 25; A. 17. West Indies, north to Pensacola, Florida.

(*Anthias saponaceus* Bloch & Schneider, Systema Ichth., 1801, 310; Cuv. & Val., III, 63; Günther, I, 172; *Eleutheractis coriaceus* Cope, Trans. Am. Phil. Soc., 1871, 467.)

<sup>7</sup> *Rhypticus xanti* Gill, Proc. Ac. Nat. Sci. Phila., 1862, 250. Cape San Lucas, and southward.

§ *Promicropterus* Gill.998. *Rhypticus bistrispinus*<sup>1</sup> Mitchell. S. (855, 857 ?)999. *Rhypticus nigripinnis*<sup>2</sup> Gill. P. (856)

## Family CIII.—PRIACANTHIDÆ. (87)

315.—**PRIACANTHUS** Cuvier.1000. *Priacanthus catalufa*<sup>3</sup> Poey. W.316.—**PSEUDOPRIACANTHUS**<sup>4</sup> Bleeker.1001. *Pseudopriacanthus altus* Gill. B. (859)Family CIV.—LOBOTIDÆ.<sup>5</sup>317.—**LOBOTES** Cuvier. (285)1002. *Lobotes surinamensis* Bloch. N. S. W. P. (876)

## Family CV.—SPARIDÆ.

318.—**XENICHTHYS** Gill.1003. *Xenichthys xanti*<sup>6</sup> Gill. P.319.—**XENISTIUS** Jordan & Gilbert. (281)1004. *Xenistius californiensis* Steindachner. C. (860)320.—**HOPLOPAGRUS**<sup>7</sup> Gill.1005. *Hoplopagrus güntheri* Gill. P.

<sup>1</sup> *Bodianus bistrispinus* Mitchell, Amer. Monthly Magazine, IV, 1818, 247 (Straits of Bahama) = *Rhypticus maculatus* Holbrook = ? *Rhypticus pituitosus* Goode & Bean (young). The specimen from Newport, R. I., recorded by Cope as *Promicropterus decoratus* seems to belong to this species.

<sup>2</sup> *Rhypticus nigripinnis* Gill, 1861. *Rhypticus maculatus* Gill, 1862 = *Promicropterus decoratus* Gill, 1863. Cape San Lucas to Panama.

<sup>3</sup> The species called in the Synopsis *Priacanthus macrophthalmus* (p. 544) and *Priacanthus arenatus* (p. 971) should stand as *Priacanthus catalufa* Poey; *Catalufa*, Big-eye, Bull's-eye. Instead of the synonymy in the Synopsis, read—

(*Catalufa* Parra, Deser. Dif. Piezas Hist. Nat., 1787; *Priacanthus macrophthalmus* Cuv. & Val., III, 95 in part; not *Anthias macrophthalmus* Bloch, which is an East Indian species; *Priacanthus macrophthalmus* Günther, I, 215; *Priacanthus catalufa* Poey, Proc. Ac. Nat. Sci. Phila., 1863, 182; not *Priacanthus arenatus* C. & V.)

<sup>4</sup> *Pseudopriacanthus* Bleeker should be recognized as a genus distinct from *Priacanthus*.

<sup>5</sup> The genus *Lobotes* should be removed from the family of *Sparidae* and placed in or near the *Serranidae*, with which it agrees in many respects, differing in the absence of teeth on the vomer. It may stand as a separate family *LOBOTIDÆ*, which has been defined by Professor Gill, Proc. U. S. Nat. Mus., 1882, 560.

<sup>6</sup> *Xenichthys xanti* Gill, Proc. Ac. Nat. Sci. Phila., 1863, 83 = *Xenichthys xenops* Jordan & Gilbert, Bull. U. S. Fish Com., 1882, 325. Cape San Lucas to Panama.

<sup>7</sup> **HOPLOPAGRUS** Gill.

(Gill, Proc. Ac. Nat. Sci. Phila., 1862, 253; type *Hoplopagrus güntheri* Gill.)

This genus resembles *Lutjanus* in most respects, differing strikingly in the structure of the anterior nostril and in the dentition. The anterior nostril is remote from the

321.—*LUTJANUS*<sup>1</sup> Bloch.

1006. *Lutjanus argentiventris*<sup>2</sup> Peters. P.  
 1007. *Lutjanus caxis*<sup>3</sup> Bloch & Schneider. W.  
 1008. *Lutjanus jocù*<sup>4</sup> Bloch & Schneider. W.  
 1009. *Lutjanus griseus*<sup>5</sup> Linnaeus. S. W. 862, 862 b., 864)  
 1010. *Lutjanus novemfasciatus*<sup>6</sup> Gill. P.  
 1011. *Lutjanus guttatus*<sup>7</sup> Steindachner. P.  
 1012. *Lutjanus synagris* Linnaeus. W. (864 b.)  
 1013. *Lutjanus vivanus*<sup>8</sup> Cuv. & Val. S. W. (862 c., 863)  
 1014. *Lutjanus analis*<sup>9</sup> Cuv. & Val. W.  
 1015. *Lutjanus colorado*<sup>10</sup> Jordan & Gilbert. P.  
 1016. *Lutjanus aratus*<sup>11</sup> Günther. P.  
 1017. *Lutjanus inermis*<sup>12</sup> Peters. P.

322.—*OCYURUS* Gill.

1018. *Ocyurus chrysurus*<sup>13</sup> Bloch. W. (861)

posterior and is placed near the end of the snout; vomer with three large molar teeth; teeth in jaws coarse and blunt. Otherwise as in *Lutjanus*. One species known. (*Ὀρλός*, armed; *πάγρος*, *Pagrus*, Spanish "Pargo," English "Porgree," a general name for sparoid fishes.)

*Hoplopagrus güntheri* Gill, l. c. 253; Steindachner, Ichth. Beitr., VI, 1, 1878; Jordan & Swain, Proc. U. S. Nat. Mus., 1884, 429. Cape San Lucas to Panama.

<sup>1</sup> For a full account of the American species of *Lutjanus* and related genera (*Hoplopagrus*, *Ocyurus*, *Rhomboplites*, *Tropidinius*, *Aprion*, *Etelis*, and *Terilus*), see Jordan & Swain, Proc. U. S. Nat. Mus., 1884, 427. The characters of the genera are given by Gill, Proc. U. S. Nat. Mus., 1884, 351, and in the paper above quoted.

<sup>2</sup> *Mesoprion argentiventris* Peters, Berliner Monatsberichte, 1869, 704 = *Lutjanus argentiventris* Jordan & Swain, l. c. 434. Mazatlan to Panama.

<sup>3</sup> For synonymy and description of *Lutjanus caxis*, see Jordan & Swain, l. c. 435. West Indies, north to Key West.

<sup>4</sup> For synonymy and description of *Lutjanus jocù*, see Jordan & Swain, l. c., 437.

<sup>5</sup> *Labrus griseus* L. = *Anthias caballerote* Bloch & Schneider = *Lutjanus stearnsi* Goode & Bean = *Lutjanus caxis* Synopsis, p. 548; not *Sparus cassis* Bloch & Schneider. The common Gray or Mangrove Snapper of our southern coasts. See Jordan & Swain, l. c. 439.

<sup>6</sup> For synonymy of *Lutjanus novemfasciatus* see Jordan & Swain, l. c. 443. For description see Jordan & Gilbert, Proc. U. S. Nat. Mus., 1881, 232 (*Lutjanus prieto* J. & G.). Cape San Lucas to Panama.

<sup>7</sup> For synonymy and description of *Lutjanus guttatus*, see Jordan & Swain, l. c. 447. Mazatlan to Panama.

<sup>8</sup> *Mesoprion vivanus* Cuv. & Val. = *Mesoprion campechanus* Poey = *Lutjanus blackfordi* Goode & Bean. Charleston and Pensacola to Aspinwall and the Lesser Antilles. For synonymy and description of *Lutjanus rivanus*, see Jordan & Swain, l. c. 453.

<sup>9</sup> For synonymy and description of *Lutjanus analis*, see Jordan & Swain, l. c. 455. West Indies, north to Key West.

<sup>10</sup> For synonymy and description of *Lutjanus colorado*, see Jordan & Gilbert, Proc. U. S. Nat. Mus. 1881, 338, and Jordan & Swain, l. c. 1884, 457. Mazatlan to Panama.

<sup>11</sup> For synonymy and description of *Lutjanus aratus*, see Jordan & Swain, l. c. 460. Mazatlan to Panama.

<sup>12</sup> For synonymy and description of *Lutjanus inermis*, see Jordan & Swain, l. c. 459. One specimen known, from Mazatlan.

<sup>13</sup> For synonymy and detailed description of *Ocyurus chrysurus*, see Jordan & Swain, Proc. U. S. Nat. Mus., 1884, 461.

323.—**RHOMBOPLITES** Gill.1019. **Rhomboplites aurorubens**<sup>1</sup> Cuv. & Val. W. S. (865)324.—**CONODON** Cuv. & Val. (282 b.)1020. **Conodon nobilis** Linnaeus. W. (866)1021. **Conodon serrifer**<sup>2</sup> Jordan & Gilbert. P.325.—**ORTHOPRISTIS**<sup>3</sup> Girard.§ *Microlepidotus* Gill.1022. **Orthopristis inornatus**<sup>4</sup> Gill. P.§ *Orthopristis*.1023. **Orthopristis brevipinnis**<sup>5</sup> Steindachner. P.1024. **Orthopristis cantharinus**<sup>6</sup> Jenyns. P.1025. **Orthopristis chalceus**<sup>7</sup> Günther. P.1026. **Orthopristis chrysopterus**<sup>8</sup> Linnaeus. S. W. (867, 868)326.—**POMADASYS** Lacépède. (283)§ *Hamulopsis* Steindachner.1027. **Pomadasys leuciscus**<sup>9</sup> Günther. P.1028. **Pomadasys elongatus**<sup>10</sup> Steindachner. P.1029. **Pomadasys nitidus**<sup>11</sup> Steindachner. P.1030. **Pomadasys axillaris**<sup>12</sup> Steindachner. P.

<sup>1</sup> For synonymy and description of *Rhomboplites aurorubens*, see Jordan & Swain, l. c. 464.

<sup>2</sup> *Conodon serrifer* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 351. Boca Soledad, Lower California.

<sup>3</sup> It is probably better to regard *Conodon*, *Orthopristis*, and *Anisotremus* as generically distinct from *Pomadasys*. See Jordan & Gilbert, Proc. U. S. Nat. Mus., 1881, 384, for an analysis of the characters of the Pacific coast species of this group.

<sup>4</sup> *Microlepidotus inornatus* Gill, Proc. Ac. Nat. Sci. Phila., 1862, 256. Cape San Lucas (not *Pomadasys inornatus* Jordan & Gilbert, l. c. 388).

<sup>5</sup> *Pristipoma brevipinne* Steindachner, Ichthyol. Notizen, VIII, 1869, 10. Mazatlan to Panama. See Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 625.

<sup>6</sup> *Pristipoma cantharinum* Jenyns, Zoöl. Voy. Beagle, 49, 1842, and Günther, I, 363. Günther's description agrees with a specimen from Guaymas, diagnosed by Jordan & Gilbert, Proc. U. S. Nat. Mus., 1881, 274 as "*Pomadasys? inornatus*," and on page 388, l. c., as *P. cantharinus*. This species is distinct from *O. chalceus*, and is probably the original *cantharinus* from the Galapagos Islands. I have, however, seen specimens of *O. chalceus* from the Galapagos.

<sup>7</sup> For synonymy and diagnosis of *Orthopristis chalceus* see Jordan & Gilbert, Proc. U. S. Nat. Mus., 1881, 387. Mazatlan to Galapagos Islands.

<sup>8</sup> *Pterea chrysoptera* Linn. Syst. Nat.=*Pristipoma fulromaculatum* and *P. fasciatum* of Cuv. & Val. The Linnean type, sent by Dr. Garden from Charleston, has been identified by Dr. Bean.

<sup>9</sup> For diagnosis see Jordan & Gilbert, l. c. 387. Mazatlan to Panama.

<sup>10</sup> *Pristipoma leuciscus* var. *elongatus*, Steindachner, Neue & Seltene Fische aus K. K. Museum, Wien, &c., 1879, taf. 9, f. 2. *Pomadasys elongatus* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 352. Mazatlan to Panama.

<sup>11</sup> For diagnosis of *Pomadasys nitidus* see Jordan & Gilbert, l. c. 387. Mazatlan to Panama.

<sup>12</sup> For diagnosis of *Pomadasys axillaris* see Jordan & Gilbert, l. c. 387. Gulf of California to Panama.

§ *Pseudopristipoma* Sauvage.1031. *Pomadasys panamensis*<sup>1</sup> Steindachner. P.§ *Pomadasys*.1032. *Pomadasys branicki*<sup>2</sup> Steindachner. P.1033. *Pomadasys macracanthus*<sup>3</sup> Günther. P.327.—**ANISOTREMUS** Gill.1034. *Anisotremus dorvii*<sup>4</sup> Günther. P.1035. *Anisotremus cæsius*<sup>5</sup> Jordan & Gilbert. P.1036. *Anisotremus interruptus*<sup>6</sup> Gill. P. (871 b.)1037. *Anisotremus bilineatus* Cuv. & Val. W. (871)1038. *Anisotremus davidsoni* Steindachner C. (869)1039. *Anisotremus virginicus* Linnaeus. W. (870)1039 b. *Anisotremus virginicus*<sup>7</sup> *taniatus* Gill. P.328.—**HÆMULON**<sup>8</sup> Cuvier.§ *Orthostachnus* Gill.1040. *Hæmulon maculicauda*<sup>9</sup> Gill. P.§ *Lythrunon* Jordan & Swain.1041. *Hæmulon flaviguttatum*<sup>10</sup> Gill. P.§ *Bathystoma* Seudder.1042. *Hæmulon aurolineatum*<sup>11</sup> Cuv. & Val. W. (874 b.)1043. *Hæmulon rimator*<sup>12</sup> Jordan & Swain. S. W. (873)

<sup>1</sup> For diagnosis of *Pomadasys panamensis* see Jordan and Gilbert, l. e. 387. Mazatlan to Panama.

<sup>2</sup> For diagnosis of *Pomadasys branicki* see Jordan and Gilbert, l. e. 386. Mazatlan to Tumbez, Peru.

<sup>3</sup> For diagnosis of *Pomadasys macracanthus* see Jordan & Gilbert, l. e. 386. Mazatlan to Panama.

<sup>4</sup> For diagnosis of *Anisotremus dorvii* see Jordan & Gilbert, l. e. 386. Mazatlan to Panama.

<sup>5</sup> *Pomadasys cæsius* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1881, 383. Mazatlan.

<sup>6</sup> *Anisotremus modestus* Tschudi, accredited to Mazatlan (as *Pristipoma notatum*), by Peters, is here omitted, for reasons given in Proc. Ac. Nat. Sci. Phila., 1883, 286.

<sup>7</sup> *Anisotremus taniatus* Gill. Proc. Ac. Nat. Sci. Phila., 1861, 107. Gulf of California to Panama. For characters of this subspecies see Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 372.

<sup>8</sup> The generic name *Diabasis* is preoccupied and must give place to *Hæmulon*. For a detailed account of the species of this genus see Jordan & Gilbert, Proc. U. S. Nat. Mus., 1884, 281.

<sup>9</sup> For an account of *Hæmulon maculicauda* see Jordan & Swain, l. e. 315. Cape San Lucas to Panama.

<sup>10</sup> See Jordan & Swain, l. e. 314. Cape San Lucas to Panama.

<sup>11</sup> *Hæmulon aurolineatum* Cuv. & Val. = *Hæmulon jeniguano* Poey. See Jordan & Swain, l. e. 310.

<sup>12</sup> *Hæmulon rimator* Jordan & Swain, l. e., 308. = *Hæmulon chrysopterum* C. & V., not of L.

§ *Brachygenys* Scudder.1044. *Hæmulon tæniatum*<sup>1</sup> Poey. W.§ *Hæmulon.*

1045. *Hæmulon flavolineatum*<sup>2</sup> Desmarest. W.  
 1046. *Hæmulon plumieri* Lacépède. S. W. (872)  
 1047. *Hæmulon sciurus*<sup>3</sup> Shaw. W. (872 b.)  
 1848. *Hæmulon steindachneri*<sup>4</sup> Jordan & Gilbert. P.  
 1049. *Hæmulon fremebundum*<sup>5</sup> Goode & Bean. W. (874)  
 1050. *Hæmulon scudderii*<sup>6</sup> Gill. P.  
 1051. *Hæmulon acutum*<sup>7</sup> Poey. W. (873 b.)  
 1052. *Hæmulon gibbosum*<sup>8</sup> Walbaum. W. (873 c.)  
 1053. *Hæmulon sexfasciatum*<sup>9</sup> Gill. P.

329.—**SPARUS** Linnæus.§ *Pagrus* Cuv. & Val.1054. *Sparus pagrus* Linnæus. S. Eu. (875)330.—**CALAMUS** Swainson. (285)

1055. *Calamus proridens*<sup>10</sup> Jordan & Gilbert. W. (876 b.)  
 1056. *Calamus calamus*<sup>11</sup> Cuv. & Val. W.  
 1057. *Calamus bajonado*<sup>12</sup> Bloch & Schneider. W.  
 1058. *Calamus brachysomus*<sup>13</sup> Lockington. P.

<sup>1</sup> For description of *Hæmulon tæniatum* see Jordan & Swain, l. e. 307. West Indies, north to Key West.

<sup>2</sup> For description and synonymy of *Hæmulon flavolineatum* see Jordan & Swain, l. e. 305. West Indies north to Key West.

<sup>3</sup> *Sparus sciurus* Shaw= *Hæmulon elegans* Cuvier. See Jordan & Swain, l. e. 301.

<sup>4</sup> *Diabasis steindachneri* Jordan & Gilbert, Bull. U. S. Fish Com., 1881, 322. Mazatlan to Panama.

<sup>5</sup> For description of the adult form of *Hæmulon fremebundum* see Jordan & Swain, l. e. 297. This species has been recently described from Jamaica under the name of *Diabasis lateralis* (Vaillant & Boeourt, Miss. Sci. au Mexique, 1883.)

<sup>6</sup> For description of *Hæmulon scudderii* see Jordan & Swain, l. e. 296. Mazatlan to Panama.

<sup>7</sup> Described by Jordan & Swain, l. e. 294.

<sup>8</sup> For description of *Hæmulon gibbosum* see Jordan & Swain, l. e. 290. The oldest binomial name of this species is that of *Perca gibbosa* Walbaum, Artedi, Piscium, 1792, 348, based on *Perca marina gibbosa*, the Margate-fish, of Catesby.

<sup>9</sup> For description of *Hæmulon sexfasciatum* see Jordan & Swain, l. e. 288.

<sup>10</sup> *Calamus proridens* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1884, 239= *Calamus pennatula* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1884, 15 (not of Guichenot). West Indies, north to Key West. For synonymy and description of this and other species of *Calamus* see Jordan & Gilbert, Proc. U. S. Nat. Mus., 1884, 15.

<sup>11</sup> For synonymy and description of *Calamus calamus* see Jordan & Gilbert, l. e. 16. West Indies, north to Key West.

<sup>12</sup> For synonymy and description of *Calamus bajonudo* see Jordan & Gilbert, l. e. 20. West Indies, north to Key West.

<sup>13</sup> *Sparus brachysomus* Lockington, Proc. U. S. Nat. Mus., 1880, 284. Magdalena Bay, southward.

1059. *Calamus leucosteus*<sup>1</sup> Jordan & Gilbert. S. (876 e.)  
 1060. *Calamus penna*<sup>2</sup> Cuv. & Val. S.W. (877)  
 1061. *Calamus arctifrons* Goode & Bean. S.W. (876 e.)

331.—**STENOTOMUS** Gill.

1062. *Stenotomus caprinus* Bean. S. (881 b.)  
 1063. *Stenotomus chrysops*<sup>3</sup> Linnaeus. N. S. (881)  
 1063 b. *Stenotomus chrysops aculeatus* Cuv. & Val. N.S. (880)

332.—**DIPLODUS** Rafinesque. (267)

§ *Lagodon* Holbrook.

1064. *Diplodus rhomboides* Linnaeus. S.W. (882)  
 1065. *Diplodus unimaculatus*<sup>4</sup> Bloch. W. (1805 b.)

§ *Archosargus* Gill.

1066. *Diplodus probatocephalus* Walbaum. N. S. (883)

§ *Diplodus*.

1067. *Diplodus holbrooki* Bean. S. (884, 885)

333.—**GIRELLA** Gray. (288)

1068. *Girella nigricans* Ayres. C. (886)

<sup>1</sup> *Calamus leucosteus* Jordan & Gilbert nom. sp. nov. "White Bone Porgy." Body formed much as in *Calamus penna*, short and deep, with steep anterior profile and high, arched back, the profile nearly straight from snout to above eyes, thence convex. Head deeper than long; the preorbital region very deep, its least depth  $2\frac{1}{2}$  in head, half greater than interorbital width. Eye rather large,  $2\frac{2}{3}$  in head in adults; a strong blunt prominence before it. Mouth rather large, the maxillary  $2\frac{2}{3}$  in head. Outer teeth in both jaws moderately enlarged, canine-like, about ten in each jaw, none of them directed forwards. Highest dorsal spine  $2\frac{1}{2}$  in head. Pectorals very long,  $2\frac{2}{3}$  in length of body. Ventrals  $1\frac{2}{3}$  in head. Scales large, those on cheeks in five rows. Smutty-silvery sides with vague cross bars; dorsal and anal fins with dark blotches; ventrals dusky; no black axillary spot. Head  $2\frac{1}{2}$ ; depth  $3\frac{1}{4}$ . D. XII, 12; A. III, 10. Scales 7-11-14. Length about a foot. Charleston, S. C.

<sup>2</sup> *Pagellus penna* Cuv. & Val. = *Pagellus milneri* Goode & Bean. For synonymy and description of *Calamus penna* see Jordan & Gilbert, l. c. 21.

<sup>3</sup> According to Dr. Bean, the types of *Sparus chrysops* and *Sparus argyrops* Linnaeus are both the common scup. The large or Southern scup, if really a distinct species or variety, should stand as *Stenotomus aculeatus* Cuv. & Val.

<sup>4</sup> *Diplodus unimaculatus* (Bloch). *Salema*; *Bream*.

This species has the teeth emarginate, as in *D. rhomboides*, and it likewise belongs to the subgenus *Lagodon*. It is distinguished from *D. rhomboides* by its deeper body, and by the longer second anal spine, which extends beyond the tip of the third spine when depressed. It has, further, 13 dorsal spines instead of 12, and its coloration is deeper and more golden. West Indies, north to Pensacola.

To the synonymy add:

(*Salema* Marcgrave, Hist. Brazil, p. 153; *Perca unimaculata* Bloch, taf. 308; *Sargus unimaculatus* Cuv. & Val., VI, 62, 1830; *Sargus unimaculatus* Günther, I, 446; *Sargus caribaeus* Poey, Memorias Cuba, II, 1860, 198; *Diplodus unimaculatus* Jordan, Proc. U. S. Nat. Mus., 1884, 126.)

334.—**KYPHOSUS** Lacépède. (289)1069. **Kyphosus sectatrix**<sup>1</sup> Linnaeus. W. S. (887)1070. **Kyphosus analogus**<sup>2</sup> Gill. P.335.—**CÆSIOSOMA**<sup>3</sup> Kaup. (290)1071. **Cæsirosoma californiense** Steindachner. S. (888)Family CVI.—CIRRHITIDÆ.<sup>4</sup>336.—**CIRRHITES** Lacépède.1072. **Cirrhites rivulatus** Valenciennes. P.

## Family CVII.—APOGONIDÆ.

337.—**APOGON** Lacépède. (291)§ *Apogon.*1073. **Apogon imberbis**<sup>5</sup> Linnaeus. En. N. (Acc.) (889)1074. **Apogon maculatus** Poey. W. (889 b.)1075. **Apogon retrosella**<sup>6</sup> Gill. P.§ *Apogonichthys* Bleeker.1076. **Apogon alutus** Jordan & Gilbert. W. (889 c.)§ *Glossamia* Gill.1077. **Apogon pandionis** Goode & Bean. B. (890)

## Family CVIII.—MULLIDÆ.

338.—**MULLUS** Linneus. (292)1078. **Mullus barbatus** (L.) **auratus** Jordan & Gilbert. S. N. En. (891)<sup>1</sup> *Percus sectatrix* L., Syst. Nat., Ed. XII, 486 = *Pimelepterus bosci* Cuv. & Val.<sup>2</sup> *Pimelepterus analogus* Gill, Proc. Ac. Nat. Sci. Phila., 1862, 245. Mazatlan to Panama.

<sup>3</sup> I now adopt the genus *Cæsirosoma* for *Scorpius californiensis*. This species differs much from the figure of *Scorpius georgiae*, to which it may not be really related. *Cæsirosoma* is certainly not a *Chatodont*, but a very near relative of *Kyphosus*. The propriety of placing *Girella*, *Kyphosus*, and *Cæsirosoma* among the *Sparidæ* is questionable. Gill has placed them together in his family *Pimelepteridae*.

<sup>4</sup> See Günther, ii, 70, for the characters of the family of *Cirrhitidae* and of the genus *Cirrhitæ*. Our species, *Cirrhites rivulatus* Valenciennes, Voyage Vénus Poiss., 399 = *Cirrhitichthys rivulatus* Günther, Fish. Centr. Amer., 1869, 421 = *Cirrhites betaurus* Gill, Proc. Ac. Nat. Sci. Phila., 1862, is found from Cape San Lucas to the Galapagos Islands.

<sup>5</sup> The specimen from Newport, R. I., recorded by Cope as *Apogon americanus*, belongs to the European species, *Apogon imberbis* L. It has been compared with the latter, at my request, by Mr. S. E. Meek.

<sup>6</sup> *Amia retrosella* Gill, Proc. Ac. Nat. Sci. Phila., 1862, 251. Cape San Lucas.

339.—**UPENEUS** Cuvier. (293)

1079. *Upeneus maculatus* Bloch. W. (892)  
 1080. *Upeneus martinicus*<sup>1</sup> Cuv. & Val. W.  
 1081. *Upeneus grandisquamis*<sup>2</sup> Gill. P.  
 1082. *Upeneus dentatus*<sup>3</sup> Gill. P.

## Family CIX.—SCLÆNIDÆ. (91)

340.—**APLODINOTUS** Rafinesque. (294)

1083. *Aplodinotus grunniens* Rafinesque. V. (893)

341.—**POGONIAS** Lacépède. (295)

1084. *Pogonias chromis* Linnaeus. S. (894)

342.—**RONCADOR** Jordan & Gilbert. (296 b.)

1085. *Roncador stearnsi* Steindachner. C. (899)

343.—**SCIÆNA** Linnaeus. (296)

§ *Stelliferus* Stark.

1086. *Sciæna lanceolata* Holbrook. S. (895)  
     § *Bairdiella* Gill.

1087. *Sciæna chrysura* Lacépède. S. (896)

1088. *Sciæna icistia*<sup>4</sup> Jordan & Gilbert. P.

§ *Sciaua*.

1089. *Sciæna jacobi* Steindachner. C. (897)

1090. *Sciæna sciera*<sup>5</sup> Jordan & Gilbert. P.

1091. *Sciæna ocellata* Linnaeus. S. (898)

344.—**JOHNIUS**<sup>6</sup> Bloch. (296 c.)

§ *Corvina* Cuvier.

1092. *Johnius saturnus* Girard. C. (900)

<sup>1</sup> *Upeneus martinicus* Cuv. & Val.

*Yellow Goat-fish: Salmonete amarilla.* Red; sides with a broad longitudinal band of bright yellow; snout with yellow streaks; vertical fins and patches on sides of head bright yellow. Body moderately elongate; anterior profile gibbous before the eyes; eyes large,  $3\frac{1}{2}$  in head. Teeth bluntnish, rather strong, in two or three series, the lower larger than the upper; no teeth on vomer. Interorbital space flat,  $3\frac{2}{3}$  in head. Barbels  $1\frac{2}{3}$  in head; longest dorsal spine  $1\frac{1}{3}$ ; anal small. Head  $3\frac{1}{2}$ ; depth 4, D. VII-9; A. 7. Scales 24-37-7. L. 1 foot. West Indies, north to Key West.

(*Upeneus martinicus* and *U. balteatus* Cuvier & Valenciennes, III, 484, 1829; *Upeneus flavorittatus* Poey, Memorias Cuba, I, 224, 1856; *Mulloides flavorittatus* Günther, I, 403.)

<sup>2</sup> *Upeneus grandisquamis* Gill, Proc. Ac. Nat. Sci. Phila., 1863, 168 = *Upeneus tetrapilus* Günther, Fish. Centr. Amer., 1869, 420. Mazatlan to Panama.

<sup>3</sup> *Upeneus dentatus* Gill, Proc. Ac. Nat. Sci. Phila., 1862, 256; Jordan & Gilbert. Proc. U. S. Nat. Mus., 1882, 363. Cape San Lucas.

<sup>4</sup> *Sciæna icistia* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1881, 356. Mazatlan.

<sup>5</sup> *Sciæna sciera* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1884, 480. Mazatlan to Panama.

<sup>6</sup> The name *Johnius* Bloch & Schneider should be used instead of *Corvina* (pp. 572, 932) for the section of *Sciæna* characterized by the absence of bony serre on the preopercle. The intergradations among the species will perhaps prevent this group from being considered as a genus from *Sciæna*.

*Johnius* Bloch & Schneider, Syst. Ichth., 1801, p. 74; type (as restricted by Cuvier & Gill) *Johnius carutta* Bloch. (Named for John, a missionary in Tranquebar.)

345.—**EQUES** Bloch. (296d.)§ *Pareques* Gill.1093. **Eques acuminatus**<sup>1</sup> Bloch & Schneider. W. (901 b.)§ *Eques*.1094. **Eques lanceolatus** Gmelin. W. (901 b.)346.—**LIOSTOMUS** Lacépède. (297)1095. **Liostomus xanthurus** Lacépède. S. (902)347.—**LARIMUS** Cuvier & Valenciennes. (302)1096. **Larimus fasciatus** Holbrook. S. (911)1097. **Larimus breviceps**<sup>2</sup> Cuv. & Val. P. W.348.—**GENYONEMUS** Gill. (298)1098. **Genyonemus lineatus** Ayres. C. (903)349.—**MICROPOGON** Cuv. & Val. (299)1099. **Micropogon undulatus** Linnaeus. N. S. (904)1100. **Micropogon ectenes**<sup>3</sup> Jordan & Gilbert. P.350.—**UMBRINA** Cuvier. (300)1101. **Umbrina roncador** Jordan & Gilbert. C. (905)1102. **Umbrina xanti**<sup>4</sup> Gill. P.1103. **Umbrina dorsalis**<sup>5</sup> Gill. P.1104. **Umbrina broussoneti** Cuv. & Val. W. (906)351.—**MENTICIRRUS** Gill. (301)1105. **Menticirrus littoralis** Holbrook. S. (908)1106. **Menticirrus elongatus**<sup>6</sup> Günther. P.1107. **Menticirrus undulatus** Girard. C. (910)1108. **Menticirrus saxatilis**<sup>7</sup> Bloch & Schneider. N. S. (907)1109. **Menticirrus alburnus** Linnaeus. S. (909)1110. **Menticirrus panamensis**<sup>8</sup> Steindachner. P.1111. **Menticirrus nasus**<sup>9</sup> Günther. P.

<sup>1</sup> The subgenus *Pareques* and its typical species *Sciæna acuminata* should be transferred to the genus *Eques*.

<sup>2</sup> *Larimus breviceps* Cuv. & Val., V, 146; Günther, I, 268. Both coasts of Tropical America, north to Mazatlan.

<sup>3</sup> *Micropogon ectenes* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1881, 355; 1882, 282. Mazatlan.

<sup>4</sup> *Umbrina xanti* Gill, Proc. Ac. Nat. Sci. Phila., 1862, 257 = *Umbrina analis* Günther, Fish. Centr. Amer., 1869, 426. For diagnosis, see Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 364.

<sup>5</sup> *Umbrina dorsalis* Gill, I. c. 1862, 257. See Jordan & Gilbert, I. c. 364.

<sup>6</sup> *Umbrina elongata* Günther, Proc. Zoöl. Soc. London, 1864, 148. For diagnosis see Jordan & Gilbert, I. c. 284. Mazatlan to Panama.

<sup>7</sup> The name *Johnius saratilis* (Bloch & Schneider, Syst. Ichth., 1801, 75, based on a specimen from New York, now in the museum at Berlin) has priority for the species called in the Synopsis, *Menticirrus nebulosus*.

<sup>8</sup> *Umbrina panamensis* Steindachner, Ichth. Beitr., IV, 9, 1875. Mazatlan to Panama. See Jordan & Gilbert, I. c. 284.

<sup>9</sup> *Umbrina nasus* Günther, Fish. Centr. Amer., 1869, 426. Mazatlan to Panama. See Jordan & Gilbert, I. c. 284.

352.—**CYNOSCIUS** Gill. (303, 304)§ *Atractoscion* Gill.

- 1112.** *Cynoscion nobile* Ayres. C. (912)

§ *Cynoscion*.

- 1113.** *Cynoscion regale* Bloch & Schneider. N. S. (915)

- 1114.** *Cynoscion thalassinum* Holbrook. S. (916)

- 1115.** *Cynoscion notum* Holbrook. S. (914)

- 1116.** *Cynoscion othonopterum*<sup>1</sup> Jordan & Gilbert. P.

- 1117.** *Cynoscion parvipinne* Ayres. C. P. (913)

- 1118.** *Cynoscion xanthulum*<sup>2</sup> Jordan & Gilbert. P.

- 1119.** *Cynoscion reticulatum*<sup>3</sup> Günther. P.

- 1120.** *Cynoscion maculatum* Mitchell. S. (917)

353.—**SERIPHUS** Ayres. (305)

- 1121.** *Seriphus politus* Ayres. C. (918)

Family CX.—**GERRIDÆ.** (92)354.—**GERRES** Cuvier. (306)§ *Gerres*.

- 1122.** *Gerres plumieri* Cuv. & Val. W. (919)

- 1123.** *Gerres lineatus*<sup>4</sup> Humboldt. P.

- 1124.** *Gerres olisthostoma* Goode & Bean. S. W. (919 b.)

- 1125.** *Gerres peruvianus*<sup>5</sup> Cuv. & Val. P.

§ *Diapterus* Ranzani.

- 1126.** *Gerres cinereus* Walbaum. PW. (921 b.)

- 1127.** *Gerres californiensis* Gill. P.

- 1128.** *Gerres gula*<sup>6</sup> Cuv. & Val. S. W. (920, 921)

- 1129.** *Gerres gracilis*<sup>7</sup> Gill. P. W. S. (922)

- 1130.** *Gerres jonesi* Günther. W.

- 1131.** *Gerres lefroyi*<sup>8</sup> Goode. W.

<sup>1</sup> *Cynoscion othonopterum* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1881, 274. Gulf of California.

<sup>2</sup> *Cynoscion xanthulum* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1881, 460. Mazatlan.

<sup>3</sup> *Otolithus reticulatus* Günther, Proc. Zoöl. Soc. London, 1864, 149. Mazatlan to Panama. For diagnosis of this and other species of *Cynoscion* see Jordan & Gilbert, Bull. U. S. Fish Comm., 1881, 319.

<sup>4</sup> For synonymy and description of *Gerres lineatus*, see Jordan & Gilbert, Proc. U. S. Mus., 1881, 330. Mazatlan to Panama.

<sup>5</sup> For synonymy and diagnosis of *Gerres peruvianus*, see Jordan & Gilbert, Bull. U. S. Fish Comm., 1881, 330. Mazatlan to Peru. For a detailed account of American species of *Gerres*, see Evermann & Meek, Proc. Ac. Nat. Sci. Phila., 1883, 116.

<sup>6</sup> *Gerres homonymus* seems to me indistinguishable from *Gerres gula*.

<sup>7</sup> *Diapterus gracilis* Gill. Proc. Ac. Nat. Sci. Phila., 1882, 246 = *Diapterus harengulus* Goode & Bean. Abundant on both coasts of Tropical America.

To its synonymy add:

(*Diapterus gracilis* Gill, Proc. Ac. Nat. Sci. Phila., 1862, 246; *Eucinostomus pseudogula* Poey, Enum. Pisc. Cubens., 124, 1875; Jordan & Gilbert, Bull. U. S. Fish Comm., 1881, 329; Evermann & Meek, Proc. Ac. Nat. Sci. Phila., 1883, 118. *Gerres aprion* Günther, IV, 255, 1862, not of C. & V.)

<sup>8</sup> *Gerres lefroyi* Goode. Bluish above the back, rather darker than in related species, with oblique dusky cross shades; faint dusky streaks along sides; lower parts

## Family CXI.—EMBIOTOCIDÆ. (93)

355.—**HYSTEROCARPUS** Gibbons. (307)**1132. Hysteroarpus traski** Gibbons. T. (923)356.—**ABEONA** Girard. (308)**1133. Abeona minima** Gibbons. C. (924)**1134. Abeona aurora** Jordan & Gilbert. C. (925)357.—**BRACHYISTIUS** Gill. (308 b.)**1135. Brachyistius frenatus** Gill. C. (926)**1136. Brachyistius rosaceus** Jordan & Gilbert. C. (927)358.—**MICROMETRUS** Gibbons. (309)**1137. MicrometruS aggregatus** Gibbons. C. (928)359.—**HOLCONOTUS** Agassiz. (310)§ *Hypocritichthys* Gill.**1138. Holconotus analis** Alex. Agassiz. C. (929)§ *Hyperprosopon* Gibbons.**1139. Holconotus argenteus** Gibbons. C. (930)**1140. Holconotus agassizii** Gill. C. (931)§ *Holconotus*.**1141. Holconotus rhodoterus** Agassiz. C. (933)360.—**AMPHISTICHUS** Agassiz. (310 b.)**1142. Amphistichus argenteus** Agassiz. C. (933)361.—**HYPSURUS** Alex. Agassiz. (311)**1143. Hypsurus caryi** Agassiz. C. (934)362.—**DITREMA** Schlegel. (312)§ *Taniotoca* Alex. Agassiz.**1144. Ditrema laterale** Agassiz. C. (935)

brightly silvery; tip of spinous dorsal usually black, other fins pale; slenderer than any other of the American species; the snout rather sharp; the outlines of the body not angular; eye rather large, 3 in head, nearly equal to the flattish interorbital space; premaxillary groove linear, naked, formed as in *G. gracilis*; fins low; the longest dorsal spines, 2 in head; aural spines short; pectoral short, 1½ in head; head, 3½; depth, 3½; D, IX, 10; A, II, 8; scales, 4—45—10; L., 4 inches. West Indies, north to Cedar Key, Florida. Well distinguished from all related species by the presence of but two aural spines. The only other species with two aural spines is *G. rhombeus* C. & V., an ally of *G. olistostoma*.

(*Diapterus lefroyi* Goode, Am. Journ. Sci. Arts, 1874, 123; *Eucinostomus lefroyi* Goode, Bull. U. S. Nat. Mus. V., 1876, 39; *Eucinostomus productus* Poey, Ann. Lyce. N. Y., XI, 59, 1876; Evermann & Meek, Proc. Ac. Nat. Sci. Phila., 1883, 118.)

§ *Embiotoca* Agassiz.1145. *Ditrema jacksoni* Agassiz. C. (936)§ *Phanerodon* Girard.1146. *Ditrema atripes* Jordan & Gilbert. C. (937)1147. *Ditrema furcatum* Girard. C. (938)363.—**RHACOCHILUS** Agassiz. (313)1148. *Rhacochilus toxotes* Agassiz. C. (939)364.—**DAMALICHTHYS** Girard. (314)1149. *Damalichthys argyrosomus* Girard. C. (940)Family CXII.—**LABRIDÆ**. (94)365.—**CTENOLABRUS** Cuv. & Val. (315)§ *Tautogolabrus* Günther.1150. *Ctenolabrus adspersus* Walbaum. N. (941)366.—**HIATULA** Lacépède. (316)1151. *Hiatula onitis* Linnaeus. N. (948)367.—**LACHNOLÆMUS** Cuv. & Val. (317)1152. *Lachnolæmus maximus*<sup>1</sup> Walbaum. W. (943)368.—**BODIANUS**<sup>2</sup> Bloch. (318)1153. *Bodianus rufus* Linnaeus. W. (944)1154. *Bodianus diplotænia*<sup>3</sup> Gill. P.1155. *Bodianus pectoralis*<sup>4</sup> Gill. P.

<sup>1</sup> The species commonly known as *Lachnolæmus falcatus* must stand as *Lachnolæmus maximus* Walbaum.

The *Labrus falcatus* of Linnaeus is certainly not this species as supposed by Valenciennes, but is probably some species of *Trachynotus*. The oldest name, certainly, belonging to the *Lachnolæmus* is that of *Labrus maximus* Walbaum, Artedi *Piscium*, 1792, 261 = (*Lachnolæmus suillus* Cuvier, *Règne Animal*, Ed. II, 1829, 257, both names based on *Suillus*, the hog-fish of Catesby.)

<sup>2</sup>The genus called in the text *Harpe* must probably stand as

**BODIANUS** Bloch.

(Bloch, *Ichthyologia*, about 1780; type *Bodianus bodianus* Bloch = *Labrus rufus* L.)

The genus *Bodianus* Bloch is a medley of unrelated fishes. The group was, however, based especially on *Bodianus bodianus* Bloch, from the Portuguese name, of which (*Bodiano* or *Pudiano*) the name *Bodianus* was derived.

<sup>3</sup>*Harpe diplotænia* Gill, Proc. Ac. Nat. Sci. Phila., 1862, 140; Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 367. Cape San Lucas.

<sup>4</sup>*Harpe pectoralis* Gill, l. c. 141. Gulf of California southward. This is probably the male of *Bodianus diplotænia*.

369.—**DECODON**<sup>1</sup> Günther.**1156.** *Decodon puellaris* Poey. W.370.—**TROCHOCOPUS** Günther. (318b.)§ *Pimelometopon* Gill.**1157.** *Trochocopus pulcher* Ayres. C. (945)371.—**PLATYGLOSSUS** Bleeker. (319)**1158.** *Platyglossus radiatus*<sup>2</sup> Linnaeus. W. (946)**1159.** *Platyglossus bivittatus*<sup>3</sup> Bloch. S. W. (947; 948)**1160.** *Platyglossus caudalis* Poey. W. (948b.)<sup>1</sup> **DECODON** Günther.(Günther, Cat. Fish. Brit. Mus., IV, 101, 1862; type *Cossyphus puellaris* Poey.)

Body moderately compressed, oblong, covered with large scales; head oblong; cheeks, opercles, and lower limb of preopercle scaly, the posterior limb being naked; base of dorsal and anal not scaly; lateral line continuous. Teeth essentially as in *Harpe*, those of the jaws in a single series; four canines in the front of each jaw; a posterior canine on each premaxillary. Dorsal with eleven spines; anal with three. A single species, intermediate between *Bodianus* and *Trochocopus*, having the large scales of the former and the naked fins of the latter. Apparently the genera in this group have been too much subdivided. (*Δεκαδόν*, ten; *οδούς*, tooth; there being ten canines.)

*Decodon puellaris.*

Rose-colored, with three large red blotches; head with several pearl-colored streaks (yellow in life); a transverse one between the nostrils; two oblique ones running from orbit towards subopercle, and a broad one from angle of mouth to angle of preopercle. Some yellow spots on sides of head. Each scale on sides with a yellow spot on its edge. Fins mostly red, the soft dorsal and anal with four rounded yellow spots; several spots on spinous dorsal and caudal (Poey). Eye rather large, as wide as interorbital space, shorter than snout. Maxillary reaching a little beyond eye. Edge of preopercle minutely denticulated, the angle rounded, projecting somewhat beyond the posterior edge; opercle with a membranaceous flap. Ventrals not reaching vent; caudal emarginate. Head 4 in total length; depth 4½. D. XI, 10; A. III, 10. Scales 24–30–8. L. 10 inches. West Indies, north to Pensacola.

(*Cossyphus puellaris* Poey, Memorias Cuba, 1860, II, 210; Günther, IV, 101. Jordan, Proc. U. S. Nat. Mus., 1884.)

<sup>2</sup> *Platyglossus radiatus*. *Pudding-wife*; *Doncella*; *Blue-fish*.

This species (*Platyglossus radiatus* of the text; and *cyanostigma* of the addenda) is the original *Labrus radiatus* L., Syst. Nat., Ed. X, 288, 1758, based on *Turdus oculo radiato*, the Pudding-wife, of Catesby. It reaches a much larger size than our other species. The ground color in the males is blue, in the females chiefly of a bronze-olive. Both are most brilliantly colored. Lower pharyngeals T-shaped, but little broader than long.

<sup>3</sup> *Platyglossus bivittatus*. *Slippery Dick*.

This is the *Sparus radiatus* of Linnaeus, Syst. Nat., Ed. XII, 472, 1766, based on a specimen sent from Charleston by Dr. Garden. It varies considerably with age and surroundings. The names *grandisquamis*, *humeralis*, and *florealis* represent different stages of growth. Lower pharyngeal T-shaped, more than twice as broad as long.

1161. *Platyglossus maculipinna*<sup>1</sup> Müller & Troschel. W.  
 1162. *Platyglossus semicinctus* Ayres. C. (949)  
 1163. *Platyglossus dispilus*<sup>2</sup> Günther. P.

372.—**PSEUDOJULIS** Bleeker. (320)*§ Pseudojulis.*

1164. *Pseudojulis notospilus*<sup>3</sup> Günther. P.

*§ Oxyjulis.* Gill.

1165. *Pseudojulis modestus* Girard. C. (950)

373.—**THALASSOMA**<sup>4</sup> Swainson.

1166. *Thalassoma lucasanum* Gill. P.

374.—**DORATONOTUS**<sup>5</sup> Günther.

1167. *Doratonotus thalassinus* Jordan & Gilbert. W.

<sup>1</sup> *Platyglossus maculipinna* Müller & Troschel.

Dorsal fin with a black (blue) spot between the fifth and seventh spines and with a band along the middle of the soft portion; a small black spot posteriorly in the axil of the dorsal; a broad dark band runs from the head to the caudal fin, below the lateral line; sometimes a dark spot below the band on the middle of the body; a blue band from the snout through the eye to the operculum, and another above it from the snout to the eye; both bands are united, forming a V. Three bluish bands across the nape and three white ones on the cheek. Base of the pectoral with a small black spot. Caudal rounded. D. IX, 11; A. III, 11. Scales 28-29 (Günther), West Indies; a young specimen taken by us at Beaufort, N. C., in 1877.

(*Julis maculipinna* Müller & Troschel, Hist. Barbadoes, 674; Günther, IV, 165. "*Pusa*"<sup>6</sup> *radiata* Jor. & Gill., Proc. U. S. Nat. Mus. 1878, 374.)

<sup>2</sup> *Platyglossus dispilus* Günther, Proc. Zool. Soc. London, 1864, 25, and Fish. Centr. Amer., 1869, 447. Mazatlan to Panama.

<sup>3</sup> *Pseudojulis notospilus* Günther II, cc. 26, 447. Mazatlan to Panama.

<sup>4</sup>**THALASSOMA** Swainson.

(*Julis* Günther, not of Cuvier, whose type *Labrus julis* L. is a species of *Coris*; not of Swainson, who also restricted *Julis* to the species of *Coris*.)

(Swainson, Classn. Anim. II, 1839, 224; type *Julis purpureus* Rüppell.)

This genus differs from *Platyglossus* in the possession of but eight spines in the dorsal, and in having no posterior canine tooth. The numerous species are gaily colored, like those of *Platyglossus*. They are found chiefly in the Western Pacific. (*Θάλασσα*, the sea; *σῶμα*, body, from the sea-green color of *T. purpureum*.)

*Thalassoma lucasanum* = *Julis lucasana* Gill., Proc. Ac. Nat. Sci. Phila., 1862, 142; *Julis lucasana* Günther, IV, 184. Gulf of California.

<sup>5</sup>**DORATONOTUS** Günther.

(Günther, Cat. Fishes Brit. Mus. IV, 124, 1862; type *Doratonotus megalepis* Günther.)

Body compressed; head not compressed to an edge anteriorly; its profile in front straight or concave; preorbital not very deep; mouth rather wide; teeth in a single series, two large canines in front in each jaw; a posterior canine; cheeks and opercles scaly; gill membranes united, free from the isthmus; scales large; lateral line interrupted behind, beginning again lower down; dorsal fin with nine strong pungent spines; some of the anterior elevated, the median spines short, so that the outline of the fin is concave; caudal rounded. Colors brilliant. Size small. Two species, each known from a single specimen. (*Δόρυ* (*δοράτος*), spear; *νῶτος*, back.)

*Doratonotus thalassinus* Jordan & Gilbert, Proc., U. S. Nat. Mus., 1884, 28. Key West.

375.—**XYRICHTHYS** Cuvier. (321)§ *Xyrichthys.*

1168. **Xyrichthys psittacus**<sup>1</sup> L. S. W. (951)  
 1169. **Xyrichthys mundiceps**<sup>2</sup> Gill. P.

§ *Iniistius* Gill.

1170. **Xyrichthys mundicorpus**<sup>3</sup> Gill. P.

§ *Dimalacocentrus* Gill.

1171. **Xyrichthys rosipes**<sup>4</sup> Jordan & Gilbert. W.

376.—**CRYPTOTOMUS**<sup>5</sup> Cope. (322)

1172. **Cryptotomus ustus** Cuv. & Val. W. (953)  
 1173. **Cryptotomus beryllinus**<sup>6</sup> Jordan & Swain. W.

377.—**SPARISOMA**<sup>7</sup> Swainson.

1174. **Sparisoma radians** Cuv. & Val. W. (954 d.)

<sup>1</sup> *Coryphana psittacus* L.. Syst. Nat., XII, 448, 1766= *Coryphana lineata* Gmelin = *Xyrichthys vermiculatus* Poey. The type of *Coryphana psittacus* was sent from Charleston by Dr. Gardeau, and it has been identified as a *Xyrichthys* by Dr. Bean, who has examined it in London. Possibly another species of this type (*Xyrichthys venustus* Poey = *X. lineatus* C. & V.) occurs with the preceding on our coasts.

<sup>2</sup> *Xyrichthys mundiceps* Gill, Proc. Ac. Nat. Sci. Phila., 1862, 143; Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 367. Cape San Lucas.

<sup>3</sup> *Iniistius mundicorpus* Gill, l. c., 1862, 145; *Noracula mundicorpus* Jordan & Gilbert, l. c., 367. Cape San Lucas. The subgenus, *Iniistius* (Gill, Proc. Ac. Nat. Sci. Phila., 1862, 145; type *Xyrichthys paro* Cuv. & Val.) is distinguished from *Xyrichthys* by the prolongation and separation from the fin of the first two dorsal spines.

<sup>4</sup> *Xyrichthys rosipes* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1884, 27. Key West. The subgenus *Dimalacocentrus* Gill (Proc. Ac. Nat. Sci. Phila., 1863, 223; type *Noraculichthys callosoma* Bleeker), is distinguished from *Xyrichthys* by the rounded (not trenchant) anterior edge of the head, and by the partial separation of the first two dorsal spines from the rest of the fin.

<sup>5</sup> *Cryptotomus* Cope (Trans. Am. Phil. Soc., 1871, 462; type *Cr. roseus* Cope) = *Callidodon* Cuv.; not of Bloch & Schneider, which is *Scarus* Forskål. For a detailed account of our genera and species of Scaroid fishes, see Jordan & Swain, Proc. U. S. Nat. Mus., 1884, 81.

<sup>6</sup> *Cryptotomus beryllinus* Jordan & Swain, Proc. U. S. Nat. Mus., 1884, 101. Key West and Havana.

<sup>7</sup> **SCARUS** Forskål.

The two groups *Scarus* (= *Hemistoma* Swainson, and *Pseudoscarus* Bleeker) and *Sparisoma* (= *Scarus* Bleeker) are really very distinct genera, each represented by several species among the Florida Keys. They may be thus defined:

**SCARUS** Forskål.

(*Callidodon* Gronow; *Hemistoma* Swainson; *Pseudoscarus* Bleeker.)

(Forskål, Descr. Anim. Orientali Observ., 1775, 25; type *Scarus psittacus* Forskål, &c.)

Lower pharyngeal spoon-shaped, much longer than broad, transversely concave; teeth fully coalesced, divided in each jaw by a distinct median suture; skull broad above; gill membranes forming a fold across the narrow isthmus; dorsal spines flex-

- 1175. Sparisoma xystrodon**<sup>1</sup> Jordan & Swain. W.  
**1176. Sparisoma cyanoleucum**<sup>2</sup> Jordan & Swain. W.  
**1177. Sparisoma flavescens**<sup>3</sup> Bloch & Schneider. W. (954 c.)

**378.—SCARUS** Forskål. (323)

- 1178. Scarus croicensis** Bloch. W. (954 b.)  
**1179. Scarus cœruleus**<sup>4</sup> Bloch W.  
**1180. Scarus guacamaia** Cuvier. W. (954)  
**1181. Scarus perrico**<sup>5</sup> Jordan & Gilbert. P.

**Family CXIII.—CICHLIDÆ. (95)**

**379.—HEROS** Heckel. (324)

- 1182. Heros cyanoguttatus** Baird & Girard. Vsw. (955)  
**1183. Heros pavonaceus** Garman. Vsw. (955 b.)

**Family XIV.—POMACENTRIDÆ. (96)**

**380.—POMACENTRUS** Lacépède.

§ *Pomacentrus*.

- 1184. Pomacentrus obscuratus**<sup>6</sup> Poey. W.  
**1185. Pomacentrus leucostictus** Müller & Troschel. W. (956)  
**1186. Pomacentrus caudalis**<sup>7</sup> Poey. W.

ible, lateral line interrupted, its pores nearly simple; scales about head comparatively numerous, lower jaw included; upper pharyngeal teeth in two rows. Species mostly of large size, brightly colored; sexes similar.

**SPARISOMA** Swainson.

(*Scarus* Bleeker.)

(Swainson, Nat. Hist. Class'n Fishes, &c., 1839, II, 227; type *Sparus abildgaardii* Bloch.)

Lower pharyngeal much broader than long, its surface slightly concave; teeth less perfectly coalescent than in *Scarus*; the median suture not very distinct; skull narrow; gill membranes broadly united to the isthmus; dorsal spines pungent; lateral line continuous, its pores very much branched; scales about head few and large, those on cheeks in one row; lower jaw projecting; upper pharyngeal teeth in three rows. Species mostly of small size. (*Sparus*; σωμα, body.)

<sup>1</sup> *Sparisoma xystrodon* Jordan & Swain, l. c. 99. Havana and Key West.

<sup>2</sup> *Sparisoma cyanoleucum* Jordan & Swain, l. c. 98. Key West.

<sup>3</sup> For synonymy and description of *Sparisoma flavescens* (*Scarus squalidus* Poey), see Jordan & Swain, l. c. 92. Key West, southward.

<sup>4</sup> For synonymy and description of *Scarus cœruleus*, see Jordan & Swain, l. c. 85.

<sup>5</sup> *Scarus perrico* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1881, 357. Mazatlan to Panama.

<sup>6</sup> *Pomacentrus obscuratus* Poey, Enumeratio Piscium Cubensem, 1875, 101; Jordan, Proc. U. S. Nat. Mus., 1884, 133. Key West to Cuba.

<sup>7</sup> *Pomacentrus caudalis* Poey, Synopsis Piscium Cubensem, 328, 1868.

Upper parts dusky, the greater part of each scale light grayish blue; lower parts bright yellow, with some blue spots on the scales; top and sides of head similarly marked with bluish spots on the scales. A jet-black, ink-like spot ocellated with blue on the back of the tail. Dorsal fin colored like the back; the posterior rays abruptly yellow; caudal fin bright yellow; lower fins chiefly yellow. Form oblong, ovate; the anterior profile moderately convex. Preorbital and preopercle well serrated. Teeth moderate, entire. Soft parts of dorsal and anal rather high. Head  $3\frac{1}{2}$ ; depth  $2\frac{1}{2}$ . D. XII, 14; A. II, 13. Scales 4-29-9. Cuba; lately obtained at Pensacola, by Silas Stearns.

1187. *Pomacentrus rectifraenum*<sup>1</sup> Gill. P.1188. *Pomacentrus flavilatus*<sup>2</sup> Gill. P.§ *Hypsypops* Gill.1189. *Pomacentrus quadrigutta*<sup>3</sup> Gill. P.1190. *Pomacentrus rubicundus*<sup>4</sup> Girard. C. (957)381.—**GLYPHIDODON** Lacépède. (325 b.)1191. *Glyphidodon declivifrons* Gill. W. P. (958)1192. *Glyphidodon saxatilis* Linnæus. W. (950)1192b. *Glyphidodon saxatilis troscheli*<sup>5</sup> Gill. P.382.—**CHROMIS** Cuvier. (326)1193. *Chromis punctipinnis* Cooper. C. (960)1194. *Chromis atrilobatus*<sup>6</sup> Gill. P.1195. *Chromis insolatus* Cuv. & Val. W. (961)1196. *Chromis enchyrsurus* Jordan & Gilbert. W. (961 b.)Family CXV.—**EPHIPIPIDÆ**. (97)383.—**CHÆTODIPTERUS** Lacépède. (327)1197. *Chætodipterus faber* Bronsonet. N. S. W. (962)1198. *Chætodipterus zonatus*<sup>7</sup> Girard. P.Family CXVI.—**CHÆTODONTIDÆ**. (98)384.—**CHÆTODON** Linnæus. (328)1199. *Chætodon maculocinctus* Gill. (Acc.) (963)1200. *Chætodon ocellatus*<sup>8</sup> Bloch. W. (963 b.)1201. *Chætodon capistratus* Linnæus. W. (963 c.)1202. *Chætodon humeralis*<sup>9</sup> Günther. P.1203. *Chætodon nigrirostris*<sup>10</sup> Gill. P.

<sup>1</sup> *Pomacentrus rectifraenum* Gill, Proc. Ac. Nat. Sci., Phila., 1862, 148; 1863, 244 = *Pomacentrus analigutta* Gill, in Günther, IV, 27. Gulf of California to Panama.

<sup>2</sup> *Pomacentrus flavilatus* Gill, Proc. Ac. Nat. Sci. Phila., 1862, 148; 1863, 214 = *Pomacentrus bairdii* Gill, l. c., 1863, 217. Cape San Lucas. See Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 365.

<sup>3</sup> *Hypsypops dorsalis* Gill, Proc. Ac. Nat. Sci. Phila., 1862, 147 = *Pomacentrus quadrigutta* Gill, Proc. Ac. Nat. Sci. Phila., 1862, 149; the name *dorsalis* is preoccupied in *Pomacentrus*. Cape San Lucas.

<sup>4</sup> For description of the young of *Pomacentrus rubicundus*, see Rosa Smith, Proc. U. S. Nat. Mus., 1882, 652.

<sup>5</sup> *Glyphidodon troscheli* Gill, Proc. Ac. Nat. Sci. Phila., 1862, 150. Cape San Lucas to Panama: perhaps not at all different from *G. saxatilis*.

<sup>6</sup> *Chromis atrilobatus* Gill, Proc. Ac. Nat. Sci. Phila., 1862, 149. Cape San Lucas to Panama.

<sup>7</sup> *Ephippus zonatus* Girard, U. S. Pat. R. R. Ex pl., 1852, 110. San Diego to Panama. Pacific coast specimens of *Chatodipterus* differ from the ordinary *C. faber* in the less development of the third dorsal spine, which is little longer or higher than the others. The dark bands are usually more obscure in *C. zonatus*. In other respects the two forms agree very closely.

<sup>8</sup> *Chatodipterus ocellatus* Bloch, Ichth. tab. 211 = *Chatodipterus bimaculatus* Bloch, tab. 219. See Poey, Eumn. Pisc. Cuban., 1875, 62.

<sup>9</sup> *Chatodipterus humeralis* Günther, II, 19, 1860. Mazatlan to Panama.

<sup>10</sup> *Surothrodus nigrirostris* Gill, Proc. Ac. Nat. Sci. Phila., 1862, 243. Cape San Lucas.

385.—**HOLACANTHUS** Lacépède.

- 1204.** *Holacanthus strigatus*<sup>1</sup> Gill. P.  
**1205.** *Holacanthus ciliaris* Linnaeus. W. (964)

386.—**POMACANTHUS** Lacépède. (329)

§ *Pomacanthodes* Gill.

- 1206.** *Pomacanthus zonipectus*<sup>2</sup> Gill. P.  
 § *Pomacanthus*.  
**1207.** *Pomacanthus aureus*<sup>3</sup> Bloch. W.

Family CXVII.—**ACANTHURIDÆ.** (99)387.—**TEUTHIS**<sup>4</sup> Linnaeus. (330)

- 1208.** *Teuthis hepatus* Linnaeus. S. W. (966)  
**1209.** *Teuthis tractus* Poey. W. P. (966 c.)  
**1210.** *Teuthis cœruleus* Bloch. W. (967)

388.—**PRIONURUS**<sup>5</sup> Lacépède.

- 1211.** *Prionurus punctatus* Gill. P.

<sup>1</sup> *Holacanthus strigatus* Gill, Proc. Ac. Nat. Sci. Phila., 1862, 243. Cape San Lucas to Panama. *Holacanthus tricolor* (Synopsis, p. 941) should be omitted. It has not yet been taken at the Florida Keys, although doubtless occurring there.

<sup>2</sup> *Pomacanthodes zonipectus* Gill, Proc. Ac. Nat. Sci. Phila., 1862, 244 (adult) = *Pomacanthus crescentalis* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1881, 358 (Young). Gulf of California to Panama.

<sup>3</sup> *Pomacanthus aureus* (Bloch), *Black Angel, Chirivita*. The description of *Pomacanthus aureatus*, on page 616 of the Synopsis, was taken from a specimen of this species, with the exception of the following phrases, which should be suppressed: "Young with yellowish vertical bands"; the bands in the young of *P. aureus* are whitish. "Lat. l. 80-100"; this should read, "lat. l. 65." The additional characters given on page 973 are taken from the true *P. aureatus*, and should be suppressed, as should also the synonymy on page 616. The true *aureatus* is a West Indian species, not yet known from our coast; it is darker and more uniform in color than *P. aureus*, the cross-bands in the young are better defined and are yellow; the scales are smaller (lat. l. 85 to 90); and the dorsal spines are almost invariably 10 instead of 9. *P. aureus* is common in the West Indies and north to the Florida keys.

(*Chaetodon aureus* Bloch, Ichthyol.: tab. 193, f. l.; Cuvier & Val., VII, 202, 1831; *Pomacanthus balteatus* and *arcuatus* Cuv. & Val., VII, 208, 211; *Chaetodon aureus* Poey, Syn. Pisc., Cubens., 1875, 60; *Chatodon aureus* Bleeker, Archives Neerlandaises, IX, 1876, 183; Lütken, Spolia Atlantica, 1880, 571.)

<sup>4</sup> The genus *Teuthis* of Linnaeus, *Systema Naturæ*, is based on *Teuthis hepatus* L. This species, founded on *Hepatus* of Gronow, is the common species known as *Acanthurus chirurgus*, with which *A. phlebotomus* Cuv. & Val. (*nigricans* of the Synopsis) seems to be identical. The generic name *Acanthurus* must give place to *Teuthis*, and this species should stand as *Teuthis hepatus*. See Gill, Proc. Ac. Nat. Mus., 1884, 275, and Meek and Hoffman, Proc. Ac. Nat. Sci. Phila., 1884. In the latter paper is given a detailed account of the three American species of *Teuthis*.

<sup>5</sup> **PRIONURUS** Lacépède.

(Lacépède, Annales Museum, Paris, IV, 205; type *Prionurus microlepidotus* Lac.)

This genus differs from *Teuthis* chiefly in the armature of the tail, which consists of a series of 3 to 6 bony keeled laminae on each side. Size small. Species not very numerous, in the tropical seas. ( $\Pi\rhoιων$ , saw;  $\delta\upsilon\rho\alpha$ , tail.)

*Prionurus punctatus* Gill, Proc. Ac. Nat. Sci. Phila., 1862, 242. Cape San Lucas.

## Family CXVIII.—TRACHYPTERIDÆ. (100)

389.—**TRACHYPTERUS** Gouan. (331)

- 1212.
- Trachypterus altivelis**
- Kuener. B. C. (968)

Family CXIX.—BATHYMASTERIDÆ.<sup>1</sup>390.—**BATHYMASTER** Cope. (334)

- 1213.
- Bathymaster signatus**
- Cope. A. (971)

## Family CXX.—MALACANTHIDÆ. (102)

391.—**LOPHOLATILUS** Goode & Bean. (335)

- 1214.
- Lopholatilus chamæleonticeps**
- Goode & Bean. B. (972)

392.—**CAULOLATILUS** Gill. (336)

- 1215.
- Caulolatilus princeps**
- Jenyns. C. P. (973)

- 1216.
- Caulolatilus microps**
- <sup>2</sup>
- Goode & Bean. W. (974)

## Family CXXI.—GOBIIDÆ. (104)

393.—**GOBIOMORUS** Lacépède. (339)

- 1217.
- Gobiomorus dormitor**
- Lacépède. W. Vsw. (978)

- 1218.
- Gobiomorus lateralis**
- Gill.
- <sup>3</sup>
- P.

394.—**EROTELIS** Poey.

- 1219.
- Erotelis smaragdus**
- <sup>4</sup>
- Cuv. & Val. W.

<sup>1</sup> I have here dismembered the unnatural group of *Icosteidae* as given in the Synopsis, referring *Icosteus* and *Ieichthys*, in accordance with the views of Dr. Steindachner (Ichth. Beitr., XI, 4, 1881, and XII, 22, 1882), to the Scombrid series, in the neighborhood of the *Bramidae*. Steindachner considers *Schedophilus* the nearest ally of *Icosteus* (= *Schedophilopsis spinosus* Steindachner l. c.), and this may be correct.

The genus *Bathymaster* is perhaps the type of a separate family, allied to *Malacanthus*, *Latilus*, &c., or perhaps to *Opistognathus*. For the present, I unite the *Latilidae* with the *Malacanthidae*, leaving *Bathymaster* in a group by itself. This arrangement is, however, merely provisional, until the anatomy of the different forms is made known.

<sup>2</sup> *Caulolatilus microps* Goode & Bean.

The identity of our Atlantic species of *Caulolatilus* with either the Cuban *cyanops* or the Brazilian *chrysops* is as yet unproven, though not improbable. The scales in our species are smaller than they are said to be in the others. There is little difference between *C. microps* and *C. princeps* except in color. The scales of the body have each a small brownish spot at base in *C. microps*.

<sup>3</sup> *Philypnus lateralis* Gill, Proc. Ac. Nat. Sci. Phila., 1860, 123; Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 380. Streams of Northwestern Mexico.

<sup>4</sup> *Eleotris smaragdus* Cuv. & Val. *EsmERALDA nigra*.

Dusky olive, the fins mostly bluish, the dorsal with brown lines; some dark markings about eye, and on base of pectoral above. Body very long and slender, compressed behind, the form much as in *Gobionellus oceanicus*. Head depressed, flattish above, the eyes mostly superior, not half the width of the interorbital area, which has a knob near its middle. Mouth very oblique, the lower jaw much projecting,

395.—**ELEOTRIS** (Gronow) Bloch & Schneider. (340, 341 b.)

1220. **Eleotris pisonis** Gmelin. W. (981)  
 1221. **Eleotris amblyopsis** Cope. S. W. (981 b.)  
 1222. **Eleotris aequidens**<sup>1</sup> Jordan & Gilbert. P.

396.—**DORMITATOR** Gill. (341)

1223. **Dormitator maculatus** Bloch. W. (980, 981)  
 1224. **Dormitator latifrons**<sup>2</sup> Richardson. P.

397.—**GOBIUS** Linnaeus.

§ *Euctenogobius* Gill.

1225. **Gobius lyricus** Girard. S. (983)  
 1226. **Gobius encæomus** Jordan & Gilbert. S. (983 b.)

§ *Rhinogobius* Gill.

1227. **Gobius banana**<sup>3</sup> Cuv. & Val. P. W.

§ *Gobius*.

1228. **Gobius soporator** Cuv. & Val. S. W. P. (984, 982, 985)

§ *Coryphopterus* Gill.

1229. **Gobius sagittula**<sup>4</sup> Günther. P.  
 1230. **Gobius boleosoma** Jordan & Gilbert. S. (987 b.)  
 1231. **Gobius stigmaturus** Goode & Bean. S. (987 c.)  
 1232. **Gobius würdemanni**<sup>5</sup> Girard. S. (987)  
 1233. **Gobius nicholsi** Bean. A. (987 d.)  
 1234. **Gobius glaucofrænum** Gill. A. (988)

the maxillary about reaching front of eyes; teeth rather small, in bands. Fins rather high; dorsal spines slender, lower than the highest soft rays, which are  $1\frac{1}{2}$  in head. Caudal lanceolate,  $\frac{1}{3}$  longer than head. Ventrals moderate, 2 in head. Scales very small cycloid. Head  $5\frac{1}{2}$ ; depth 10 to 12 D. VI-I, 10. A, I, 9. Lat. I. about 100. L. 8 inches. West Indies, north to Key West, not ascending the fresh waters.

(Cuv. & Val., XII, 231, 1837; *Erotelis valenciennisi* Poey, Mem. Cuba, II, 273, 1860. Günther, III, 123.)

This species is the type of Poey's genus *Erotelis* (name an anagram of *Eleotris*), distinguished from *Eleotris* by the very slender form, similar to that of *Gobionellus*.

<sup>1</sup> *Culius aequidens* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1861, 461. Fresh waters of Western Mexico and Lower California.

<sup>2</sup> *Eleotris latifrons* Richardson, Voyage Sulphur, Fishes, 57 = *Dormitator microphthalmus* Gill. Streams of the Pacific coast, north to Lower California. There are some tangible differences between the specimens of *Dormitator* found on the west coast of Mexico and that found in the Atlantic waters. For an excellent account of the genera and species of *Eleotridinae*, see Eigenman and Fordise, Proc. Ac. Nat. Sci. Phila., 1885.

<sup>3</sup> *Gobius banana* Cuv. & Val., XII, 103; Günther, III, 59; Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 379. Tropical America, north to Lower California, in fresh water.

<sup>4</sup> *Euctenogobius sagittula* Günther, III, 555. *Gobius sagittula* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 380. Lower California to Panama.

<sup>5</sup> For description of *Gobius würdemanni* see Jordan, Proc. U. S. Nat. Mus., 1884, 321.

398.—**GOBIONELLUS** Girard. (345)1235. *Gobionellus oceanicus* Pallas. S. W. (989)1236. *Gobionellus stigmaticus* Poey. W. (989 b.)399.—**GILLICHTHYS** Cooper. (346)1237. *Gillichthys mirabilis* Cooper. C. (990)400.—**LEPIDOGOBIUS** Gill. (347)§ *Lepidogobius* Gill.1238. *Lepidogobius lepidus* Girard. C. (991)§ *Eucyclogobius* Gill.1239. *Lepidogobius newberryi* Girard. C. (992)1240. *Lepidogobius gulosus* Girard. S. (992 b; 986)1241. *Lepidogobius thalassinus* Jordan & Gilbert. S. (992 b.)401.—**GOBIOSOMA**<sup>1</sup> Girard. (348)1242. *Gobiosoma ceuthocum* Jordan & Gilbert. W.1243. *Gobiosoma bosci* Lacépède. N. S. (993; 994)1244. *Gobiosoma histrio*<sup>2</sup> Jordan. P.1245. *Gobiosoma zosterurum*<sup>3</sup> Jordan and Gilbert. P.1246. *Gobiosoma longipinne*<sup>4</sup> Steindachner. P.1247. *Gobiosoma ios* Jordan & Gilbert. C. (994 b.)402.—**TYPHLOGOBIUS** Steindachner. (349)1248. *Typhlogobius californiensis* Steindachner. C. (995)403.—**TYNTLASTES** Günther. (350)1249. *Tyntlastes sagitta* Günther. P. (996)404.—**IOGLOSSUS** Bean. (350 b.)1250. *Ioglossus calliurus* Bean. S. (996 b.)

## Family CXXII.—CHIRIDÆ. (105)

405.—**PLEUROGRAMMUS** Gill. (351 a.)1251. *Pleurogrammus monopterygius* Pallas. A. (997)406.—**HEXAGRAMMUS** Steller. (351 b.)1252. *Hexagrammus ordinatus* Cope. A. (998.)1253. *Hexagrammus asper* Steller. A. (999)<sup>1</sup> *Gobiosoma ceuthocum* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1884, 29. Key West; found in the cavity of a sponge.<sup>2</sup> *Gobiosoma histrio* Jordan, Proc. U. S. Nat. Mus., 1884, 260. Guaymas.<sup>3</sup> *Gobiosoma zosterurum* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1881, 361. Mazatlán.<sup>4</sup> *Gobiosoma longipinne* Steindachner, Ichth. Beitr., VIII, 1879, 24. Las Animas, Gulf of California.

1254. *Hexagrammus scaber* Bean. A. (999 b.)  
 1255. *Hexagrammus superciliosus* Pallas. A. C. (1000)  
 1256. *Hexagrammus decagrammus* Pallas. A. C. (1001)

407.—**OPHIODON** Girard. (352)

1257. *Ophiodon elongatus* Girard. C. A. (1002)

408.—**ZANIOLEPIS** Girard. (353)

1258. *Zaniolepis latipinnis* Girard. C. (1003)

409.—**OXYLEBIUS** Gill. (354)

1259. *Oxylebius pictus* Gill. C. (1004)

410.—**MYRIOLEPIS** Lockington. (355)

1260. *Myriolepis zonifer* Lockington. C. (1005)

411.—**ANOPLOPOMA** Ayres. (356)

1261. *Anoplopoma fimbria* Pallas. C. A. (1006)

## Family CXXIII.—SCORPÆNIDÆ. (106)

412.—**SEBASTES** Cuvier. (357)

1262. *Sebastes marinus* Linnaeus. G. N. Eu. (1007)

413.—**SEBASTODES** Gill. (358)

1263. *Sebastodes paucispinis* Ayres. C. (1008)

414.—**SEBASTICHTHYS** Gill.

*§ Sebastosomus* Gill.

1264. *Sebastichthys flavidus* Ayres. C. (1009)  
 1265. *Sebastichthys melanops* Girard. C. (1010)  
 1266. *Sebastichthys ciliatus* Tilesius. A. (1011)  
 1267. *Sebastichthys mystinus* Jordan & Gilbert. C. (1012)  
 1268. *Sebastichthys entomelas* Jordan & Gilbert. C. (1013)  
 1269. *Sebastichthys ovalis* Ayres. C. (1014)  
 1270. *Sebastichthys proriger* Jordan & Gilbert. C. (1015)  
 1271. *Sebastichthys brevispinis*<sup>1</sup> Bean. A.  
 1272. *Sebastichthys atrovirens* Jordan & Gilbert. C. (1016)  
 1273. *Sebastichthys pinniger* Gill. C. (1017)

<sup>1</sup> *Sebastichthys brerispinis* (Bean). Closely allied to *S. proriger*, but larger in size and more uniform in color; second anal spine shorter than third; peritoneum white. Coast of Alaska. (Bean.)

(*Sebastichthys proriger* var. *brevispinis* Bean., Proc., U. S. Nat. Mus., 1883. *Sebastodes proriger*, Alaskan specimens, Jor. & Gilb., Syn. Fish. N. A., 1883, 950.)

The statement in the Synopsis, p. 950, that *S. proriger* has been confounded by Tilesius and Pallas with *S. ciliatus* is erroneous. The specimens called by them *ciliatus* and *variabilis* include *ciliatus* and *matzubarae*. The true *proriger* is not yet known from Alaska.

1274. *Sebastichthys miniatus* Jordan & Gilbert. C. (1018)

1275. *Sebastichthys matzubarae*<sup>1</sup> Hilgendorf. A.

§ *Sebastomus* Gill.

1276. *Sebastichthys ruber* Ayres. C. (1019)

1277. *Sebastichthys umbrosus* Jordan & Gilbert. C. (1019b.)

1278. *Sebastichthys constellatus* Jordan & Gilbert. C. (1020)

1279. *Sebastichthys rosaceus* Girard. C. (1021)

1280. *Sebastichthys rhodochloris* Jordan & Gilbert. C. (1022)

1281. *Sebastichthys chlorostictus* Jordan & Gilbert. C. (1023)

1282. *Sebastichthys elongatus* Ayres. C. (1024)

1283. *Sebastichthys rubrovinctus* Jordan & Gilbert. C. (1025)

§ *Sebastichthys*.

1284. *Sebastichthys auriculatus* Girard. C. (1026)

1285. *Sebastichthys rastrelliger* Jordan & Gilbert. C. (1027)

1286. *Sebastichthys caurinus* Richardson. A. (1028)

1286 b. *Sebastichthys caurinus vexillaris* Jordan & Gilbert. C. (1028 b.)

1287. *Sebastichthys maliger* Jordan & Gilbert. C. (1029)

1288. *Sebastichthys carnatus* Jordan & Gilbert. C. (1030)

1288 b. *Sebastichthys carnatus chrysomelas* Jordan & Gilbert. C. (1031)

1289. *Sebastichthys nebulosus* Ayres. C. (1032)

1290. *Sebastichthys sericeps* Jordan & Gilbert. C. (1033)

1291. *Sebastichthys nigrocinctus* Ayres. C. (1034)

#### 415.—SEBASTOPSIS<sup>2</sup> Gill.

1292. *Sebastopsis xyris* Jordan & Gilbert. P.

#### 416.—SEBASTOPLUS<sup>3</sup> Gill.

1293. *Sebastoplus dactylopterus* De la Roche. B. Eu. (1035)

<sup>1</sup> *Sebastichthys matzubarae* (Hilgendorf). Dark red; three dark shades across cheeks. Allied to *Sebastichthys miniatus*. Spines of head low, developed about as in *S. miniatus* and *S. pinniger*. Preopercular, supraocular, postocular, tympanic, occipital, and nuchal spines distinct; a pair of small coronal spines present, as also a small spine before and one just below eye. Maxillary reaching to posterior border of eye  $1\frac{1}{2}$  in head. Both jaws covered with rough, ctenoid scales. Interorbital space flattish, scaled, its breadth a little less than that of eye. Preopercular spine short, simple. Preorbital spines simple. Lower jaw scarcely projecting. Second anal spine scarcely longer than third. Longest dorsal spine  $2\frac{3}{4}$  in head, a little less than the longest short rays. Pectoral  $4\frac{1}{2}$  in body.

Color chiefly red; three dark shades across cheek. D. XIII, 14. A. III, 7. Yeso; Aleutian Islands. The above description from a specimen in the Berlin Museum, brought by Pallas from the Aleutian Islands.

(*Perca variabilis* Pallas, Zoogr. Rosso. Asiat., III, 241, 1811, in part; the larger specimen, No. 8115, Berl. Mus.; *Scastes matzubarae* Hilgendorf, Sitzber. Gesellschaft Naturforschender Freunde, Berlin, 1880, 170; Jordau, Proc. Ac. Nat. Sci. Phila., 1883, 291.)

#### <sup>2</sup> SEBASTOPSIS Gill.

(Gill, Proc. Ac. Nat. Sci. Phila., 1862, 278; type *Sebastes polylepis* Bleeker.)

This genus differs from *Sebastichthys* in the absence of palatine teeth. The known species are small in size and not very numerous. (*Sebastes*; ὄψις, appearance.)

*Sebastopsis xyris* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 369. Cape San Lucas.

#### <sup>3</sup> SEBASTOPLUS Gill.

(Gill, Proc. Ac. Nat. Sci. Phila., 1863, 207; type *Sebastes kuhli* Lowe.)

This genus includes species which have the general characters of *Sebastichthys*, with the vertebrae and dorsal spines in smaller number, as in *Scorpaena*.

The species are red in color and mostly inhabit deep water. (*Sebastes*; ὄπλος, armed.)

417.—**SCORPÆNA** Linnaeus. (359)

1294. **Scorpæna guttata** Girard. C. (1036)  
 1295. **Scorpæna plumieri** Bloch. W.P. (1037)  
 1296. **Scorpæna grandicornis**<sup>1</sup> Cuv. & Val. W.  
 1297. **Scorpæna brasiliensis**<sup>2</sup> Cuv. & Val. W.S. (1038 b.)  
 1298. **Scorpæna occipitalis**<sup>3</sup> Poey. W. (1038 c.)

418.—**SETARCHE** Johnson. (360)

1299. **Setarches parvatus** Goode. B. (1039)

## Family CXXIV.—COTTIDÆ. (107)

419.—**HEMITRIPTERUS** Cuvier.

1300. **Hemitripterus americanus** Gmelin. G.N. (1040)  
 1300 b. *Hemitripterus americanus carifrons*<sup>4</sup> Lockington. A. (1041)

420.—**ASCELICHTHYS** Jordan & Gilbert. (362)

1301. **Ascelichthys rhodorus** Jordan & Gilbert. A. (1042)

421.—**PSYCHROLUTES** Günther. (363)

1302. **Psychrolutes paradoxus** Günther. A. (1043)

<sup>1</sup> *Scorpæna grandicornis* Cuv. & Val.

Gray, with brown shades and faint cross-bars; sides with numerous bright yellow spots in life; axil dark gray, with round white dots, each surrounded by a dark ring. Pectoral largely blackish above; a black blotch at base below; the fin largely tinged with yellow, especially on the inner side. Supraocular filament blackish, with gray fringes. Soft dorsal largely blackish toward the tip; spinous dorsal chiefly dusky; ventrals tipped with blackish; anal with three black bands; caudal with two; a faint band at its base. Body rather stout; deeper than in *S. plumieri* and much less variegated in color. Sides and head with dermal flaps; a slight depression below eye; occipital pit very deep; spines of head sharp. A few scales on opercle. Breast with rudimentary scales. Supraocular flap very large, wide and fringed, more than half length of head, reaching to beyond front of dorsal. Maxillary reaching posterior margin of eye,  $2\frac{1}{2}$  in head. Dorsal spines higher than in related species, the highest equal to second spine of anal and about half head. Head,  $2\frac{1}{2}$ ; depth,  $2\frac{1}{4}$ . D. XII, 9. A. III, 5. Lat. l, 26 (pores.)

West Indies, north to Key West.

(Cuv. & Val., IV, 1829, 309; Günther, II, 115; Poey, Syn. Pisc. Cubens. 303.)

The species of *Scorpæna* found in our waters may be readily distinguished by the color of the axillary region as follows:

*Guttata*: pale, usually unspotted; one or two dark spots behind it.

*Plumieri*: jet black, with a few large white spots.

*Brasiliensis*: pale, with several round blackish spots.

*Occipitalis*: pale, with dark specks, and a black spot above.

*Graudicornis*: dusky gray, with numerous white stellate spots.

<sup>2</sup> *Scorpæna brasiliensis* Cuv. & Val., V, 105; Günther, II, 312 = *Scorpæna stearnsi* Goode & Bean. South Carolina to Brazil.

<sup>3</sup> *Scorpæna occipitalis* Poey, (Memorias Cnba, II, 171), is probably identical with *Scorpæna calcarea* Goode & Bean.

<sup>4</sup> According to Dr. Bean, *Hemitripterus carifrons* is not distinct from *H. americanus*.

422.—**COTTUNCULUS** Collett. (364)1303. *Cottunculus microps* Collett. B. Eu. (1044)1304. *Cottunculus torvus*<sup>1</sup> Goode. B. (1045).423.—**ARTEDIUS** Girard.1305. *Artemius lateralis* Girard. C. (1046)1306. *Artemius notospilotus* Girard. C. (1047)1307. *Artemius fenestratus*<sup>2</sup> Jordan & Gilbert. A. (365)424.—**ICELUS** Kröyer.1308. *Icelus bicornis*<sup>3</sup> Reinhardt. (1048, 1053, 1083)425.—**ICELINUS**<sup>4</sup> Jordan.1309. *Icelinus quadrigeratus* Lockington. C. (1049)426.—**CHITONOTUS** Lockington.1310. *Chitonotus megacephalus* Lockington. C. (1050)1311. *Chitonotus pugetensis* Steindachner. A. (1051)427.—**ARTEDIELLUS**<sup>5</sup> Jordan.1312. *Artemediellus uncinatus* Reinhardt. G. B. (1052)428.—**URANIDEA** De Kay. (366)*Tauridea* Jordan & Rice.1313. *Uranidea ricei* Nelson. Vn. (1054)*Cottopsis* Girard.1314. *Uranidea aspera* Richardson. T. (1055)1315. *Uranidea semiscabra* Cope. R. (1056)1316. *Uranidea rhothea* Rosa Smith. T. (1056 b.)

<sup>1</sup> *Cottunculus torvus* is described in full by Goode, Bull. Mus. Comp. Zoöl., XIX, 212. Mr. Goode counts D. VII, 14; A. 13.

<sup>2</sup> *Artemius fenestratus* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 577. Puget Sound.

<sup>3</sup> According to Lütken (Vidensk. Meddels. naturh. Foren. Kjøb., 1876, 92), *Cottus bicornis* Reinhardt is identical with *Icelus hamatus* Kröyer. It is thought by Lütken that *Cottus polaris* Sabine is probably also the same fish, but if so, the description of Sabine is very erroneous. Nos. 1053 and 1083 may therefore be erased, and the species *Icelus hamatus* in the Synopsis may stand as *Icelus bicornis*.

<sup>4</sup> *Icelinus*, genus or subgenus nova for *Artemius quadrigeratus* Lockington, characterized by the peculiar squamation, preopercular armature, and form of the body as described in the Synopsis, p. 691. (Name a diminutive of *Icelus*.)

<sup>5</sup> *ARTEDELLUS* Jordan.

(Genus nova; type *Cottus uncinatus* Reinhardt.)

This genus or subgenus differs from *Icelus* proper, apparently its nearest ally, in having the skin naked and smooth. *Centridermichthys* Richardson, an Asiatic genus to which this and other American species have been sometimes referred, has the skin prickly, and a large slit behind the fourth gill, the gill membranes being fully united to the isthmus. (A diminutive of *Artemius*.)

§ *Potamocottus* Gill.

1317. *Uranidea gulosa* Girard. T. (1057)  
 1318. *Uranidea punctulata* Gill. R. (1058)  
 1319. *Uranidea bendirei* Bean. R. (1059)  
 1320. *Uranidea richardsoni* Agassiz. V. (1060)  
 1320b. *Uranidea richardsoni bairdi* Girard. Vne.  
 1320c. *Uranidea richardsoni kumlieni* Hoy. Vn.  
 1320d. *Uranidea richardsoni wilsoni* Girard. Vu.  
 1320e. *Uranidea richardsoni alvordi* Girard. Vn.  
 1320f. *Uranidea richardsoni meridionalis* Girard. Ve.  
 1320g. *Uranidea richardsoni zophera* Jordan. Vs.  
 1320h. *Uranidea richardsoni carolinæ* Gill. Vs.  
 1320i. *Uranidea richardsoni wheeleri* Cope. R.

§ *Uranidea*.

1321. *Uranidea cognata* Richardson. Vn. (1062)  
 1322. *Uranidea minuta* Pallas. Y. (1063)  
 1323. *Uranidea spilota*<sup>1</sup> Cope. Vn. (1062b.)  
 1324. *Uranidea pollicaris* Jordan & Gilbert. Vn. (1062 c.)  
 1325. *Uranidea marginata* Bean. R. (1064)  
 1326. *Uranidea viscosa* Haldeman. Ve. (1065)  
 1327. *Uranidea gracilis* Heckel. Ve. (1066)  
 1328. *Uranidea gobiooides* Girard. Ve. (1067)  
 1329. *Uranidea boleoides* Girard. Ve. (1068)  
 1330. *Uranidea franklini* Agassiz. Vn. (1069)  
 1331. *Uranidea formosa* Girard. Vn. (1069 b.)  
 1332. *Uranidea hoyi* Putnam. Vn. (1070)

429.—**COTTUS** Linnæus. (367)

1333. *Cottus octodecimspinosus*<sup>2</sup> Mitchell. N. (1072)  
 1334. *Cottus æneus* Mitchell. N. (1073)  
 1335. *Cottus scorpioides* Fabricius. G. (1074)  
 1336. *Cottus scorpius* L. G. En. (1075)  
 1336b. *Cottus scorpius grönlandicus* Cuv. & Val. N. G. (1075 b.)  
 1337. *Cottus polyacanthocephalus*<sup>3</sup> Pallas. A. (1076, 1081)  
 1338. *Cottus labradoricus* Girard. G. (1077)  
 1339. *Cottus tæniopterus* Kner. A. (1078)  
 1340. *Cottus quadricornis* L. G. Eu. (1079)  
 1341. *Cottus humilis* Bean. A. (1080)  
 1342. *Cottus axillaris* Gill. A. (1082)  
 1343. *Cottus platycephalus*<sup>4</sup> Pallas. A. (1084)  
 1344. *Cottus verrucosus* Bean. A. (1085)  
 1345. *Cottus niger* Bean. A. (1086)  
 1346. *Cottus quadrifilis* Gill. A. (1087)

<sup>1</sup> I have re-examined the type of *Uranidea spilota*. It has now no evident teeth on the palatines and the ventral rays are I, 3. The skin is smooth, and the preopercular spine, although prominent and directed upward, is not hooked. The spots on the body are less sharply defined than in *U. ricei*.

<sup>2</sup> *Cottus bubalis* should be omitted. It is a European species, and it has not yet been found in Greenland, according to Dr. Lütken.

<sup>3</sup> *Cottus jaak* should be omitted. The type, lately examined by Dr. Bean in Berlin, is identical with *Cottus polyacanthocephalus*.

<sup>4</sup> *Cottus platycephalus* Pallas, the type of which has been lately re-examined by Dr. Bean and the writer, is a valid species of *Cottus*. It has no palatine teeth.

430.—**GYMNACANTHUS** Swainson. (368)

1347. *Gymnacanthus tricuspis*<sup>1</sup> Reinhardt. G.  
 1348. *Gymnacanthus pistilliger* Pallas. A. (1088)  
 1349. *Gymnacanthus galeatus* Bean. A. (1089)

431.—**TRIGLOPSIS** Girard. (369)

1350. *Triglopsis thompsoni* Girard. Vn. (1090)

432.—**ENOPHRYS** Swainson. (370)

1351. *Enophrys bison* Girard. C. A. (1091)  
 1352. *Enophrys diceraus*<sup>2</sup> Pallas. A. (1092, 1093)

433.—**LIOCOTTUS** Girard. (371)

1353. *Liocottus hirundo* Girard. C. (1094)

434.—**TRIGLOPS** Reinhardt. (372)

1354. *Triglops pingeli* Reinhardt. G. Eu. A. (1095)

435.—**PRIONISTIUS**<sup>3</sup> Bean.

1355. *Prionistius macellus* Bean. A.

436.—**LEPTOCOTTUS** Girard. (373)

1356. *Leptocottus armatus* Girard. C. (1096)

437.—**HEMILEPIDOTUS** Cuvier. (374)

1357. *Hemilepidotus spinosus* Ayres. C. (1097)  
 1358. *Hemilepidotus jordani* Bean. A. (1098)  
 1359. *Hemilepidotus hemilepidotus* Tilesius. A. (1099)

438.—**MELLETES** Bean. (375)

1360. *Melletes papilio* Bean. A. (1100)

439.—**SCORPÆNICHTHYS** Girard. (376)

1361. *Scorpaenichthys marmoratus* Ayres. C. (1101)

<sup>1</sup> Mr. Dresel observes (Proc. U. S. Nat. Mus., 1884, 251): Dr. T. H. Bean "inclines to the belief that the Greek form of *Gymnacanthus (tricuspis)* does not occur in the Pacific. It is best, therefore, to retain Reinhardt's name, *tricuspis*, for the Atlantic species." A description of *G. tricuspis* is given by Mr. Dresel, l. c. The description in the Synopsis is also from an Atlantic specimen.

<sup>2</sup> *Enophrys clariger* is the young of *E. diceraus*, according to Dr. Bean, who has examined the types of both species.

<sup>3</sup> *PRIONISTIUS* Bean.

(Bean, Proc. U. S. Nat. Mus., 1883, 355; type *Prionistius macellus* Bean.)

Allied to *Triglops*, differing in the following respects: the much slenderer form; the absence of a series of bony tubercles along the bases of the dorsal fins, the elongation of the exserted pectoral rays so that the lower portion of the fin is considerably longer than the upper, the presence of serrations on all the dorsal spines and on the first soft ray, and the emargination of the caudal fin. Alaska. (*Πριον*, saw; *ιττιον*, sail; dorsal fin.)

*Prionistius macellus* Bean, l. c. Coast of British Columbia.

440.—**OLIGOCOTTUS** Girard. (377)§ *Clinocottus* Gill.

- 1362.
- Oligocottus analis**
- Girard. C. (1102)

§ *Oligocottus*.

- 1363.
- Oligocottus maculosus**
- Girard. C. (1103)

§ *Blennicottus* Gill.

- 1364.
- Oligocottus globiceps**
- Girard. C. (1104)

441.—**BLEPSIAS** Cuvier. (378)

- 1365.
- Blepsias cirrhosus**
- Pallas. A. (1105)

- 1366.
- Blepsias bilobus**
- Cuv. & Val. A. (1106)

442.—**NAUTICHTHYS** Girard. (379)

- 1367.
- Nautichthys oculofasciatus**
- Girard. A. (1107)

443.—**RHAMPHOCOTTUS** Günther. (380)

- 1368.
- Rhamphocottus richardsoni**
- Günther. A. (1108)

## Family CXXV—AGONIDÆ (108 a.)

444.—**ASPIDOPHOROIDES** Lacépède. (381)

- 1369.
- Aspidophoroides monopterygius**
- Bloch. N. G. (1109)

- 1370.
- Aspidophoroides inermis**
- Günther. A. (1110)

- 1371.
- Aspidophoroides olriki**
- <sup>1</sup>
- Lütken. G.

- 1372.
- Aspidophoroides güntheri**
- Bean. A.

445.—**SIPHAGONUS** Steindachner. (382)

- 1373.
- Siphagonus barbatus**
- Steindachner. G. (1111)

446.—**BRACHYOPSIS**<sup>2</sup> Gill. (383)

- 1374.
- Brachyopsis rostratus**
- Tilesius. A. (1112)

<sup>1</sup> *Aspidophoroides olriki* Lütken.

Body short and thick, much less elongate than in the other species of this genus; head broad, the interorbital space concave, as is the median line of the back; lower jaw included; snout with a short spine above; no barbels; shields without spines; breast with about ten conical striate shields. Fins very much larger than in the other species of *Aspidophoroides*, the dorsal fin about as high as long, but little larger than anal. Ventrals small,  $2\frac{3}{4}$  in head; pectorals about as long as head. Head  $4\frac{2}{5}$ ; depth 6. D. 6 or 7. A. 6 or 7. V. 1, 2. P. 13. C. 10. L. 4 inches. Greenland, from the stomachs of flounders.

(Lütken, Nordiske Ulkefiske, Vidensk. Meddels. naturh. Foren., Kjöbenhavn, 1876, 385.)

<sup>2</sup> The name *Brachyopsis* should be retained for this genus, instead of *Leptagonus*. "*Leptagonus*" *decagonus*, lately examined by me in Copenhagen, has the gill membranes attached to the isthmus and forming a narrow fold across it. It should, therefore, be referred to *Podothecus*, although in some respects approaching *Agonus*, rendering a reunion of these genera probably necessary.

1375. *Brachyopsis verrucosus* Lockington. C. (1113)  
 1376. *Brachyopsis xyosternus* Jordan & Gilbert. C. (1114)

**447.—BOTHRAGONUS** Gill. (385)

1377. *Bothragonus swani* Steindachner. A. (1117)

**448.—ODONTOPYXIS** Lockington. (386)

1378. *Odontopyxis trispinosus* Lockington. C. (1118)

**449.—PODOTHECUS** Gill. (387)

§ *Leptagonus* Gill.

1379. *Podothecus decagonus* Bloch & Schneider. G. (1115)  
 § *Podothecus*.

1380. *Podothecus vulsus* Jordan & Gilbert. C. (1119)

1381. *Podothecus acipenserinus* Tilesius. A. (1120)

Family CXXVI.—TRIGLIDÆ. (108 b.)

**450.—PERISTEDION** Lacépède. (388)

1382. *Peristedium miniatum*. Goode. B. (1121)

1383. *Peristedium imberbe*<sup>1</sup> Poey. W. B.

**451.—PRIONOTUS** Lacépède. (390)

§ *Ornichthys* Swainson.

1384. *Prionotus scitulus*<sup>2</sup> Jordan & Gilbert. (1123)

1385. *Prionotus palmipes* Mitchell. N. (1124)

1386. *Prionotus alatus*<sup>3</sup> Goode & Bean. B.

<sup>1</sup> *Peristedion imberbe* Poey.

Only a very few specimens of this fish are known; all in bad condition, having been taken from the stomachs of deep-water fishes at Havana and Pensacola. Barrels very small, scarcely visible—this character distinguishing the species from the others known in America.

(*Peristedion imberbe* Poey, Memorias, II, 389, 1860. *Peristedion micronemus* Poey, Ann. Lyc. Nat. Hist., IX, 321; Jordan, Proc. U. S. Nat. Mus., 1884.)

<sup>2</sup> I am unable to find any positive evidence of the occurrence of the West Indian *Prionotus punctatus* on the coasts of the United States, all the specimens so named being apparently either *P. scitulus* or *P. palmipes*. *Prionotus punctatus* may therefore be omitted.

<sup>3</sup> *Prionotus alatus* Goode & Bean.

Brownish, with about four faint darker cross-bands; vertical fins uniform, the caudal with a black tip and two paler shades before it; dorsal with the usual black spots; pectorals blotched and clouded. Body rather stout, covered with small, rough scales. Maxillary 3 in head; preopercular, opercular, and humeral spines strong, the latter extending farthest back. Palatine teeth few and feeble. Gill-rakers 1+6, besides some rudiments, the longest 3 in eye. Second dorsal spine longest, half head; first spine strongly serrated in front. Caudal subtruncate. Ninth ray of pectoral longest, reaching base of caudal. Pectoral appendages slender. Head 2½; depth 4, D. X—12. A. 11. P. 13+3. Scales 109; 50 tubes in lat. l. Deep water off Charleston, S. C. (Goode & Bean.)

(Goode & Bean, Bull. Mus. Comp. Zoöl., XIX, 1883, 210.)

§ *Prionotus*.

1387. *Prionotus ophryas*<sup>1</sup> Jordan & Swain. W.  
 1388. *Prionotus stearnsi*<sup>2</sup> Jordan & Swain. W.  
 1389. *Prionotus tribulus* Cuv. & Val. S. (1125)  
 1390. *Prionotus evolans*<sup>3</sup> Linnæus. S. (1126)  
 1391. *Prionotus strigatus*<sup>4</sup> Mitchell. N. (1126 b.)  
 1392. *Prionotus stephanophrys* Lockington. C. B. (1127)

## 452.—CEPHALACANTHUS Lacépède. (391)

1393. *Cephalacanthus volitans* Linnæus. N. S. W. (1128)

## Family CXXVII.—LIPARIDÆ. (109.)

453.—MONOMITRA<sup>5</sup> Goode. (392)

1394. *Monomitra liparina* Goode. B. (1129)

## 454.—CAREPROCTUS Kröyer. (393)

1395. *Careproctus gelatinosus* Pallas. A. (1130 b.)  
 1396. *Careproctus reinhardti* Kröyer. G. (1130 b.)

## 455.—LIPARIS Linnæus. (394)

§ *Actinochir* Gill.

1397. *Liparis major* Walbaum. G. (1131)

§ *Liparis*.

1398. *Liparis pulchella* Ayres. C. (1132)  
 1399. *Liparis gibba* Bean. A (1133)  
 1400. *Liparis tunicata* Reinhardt. G. (1135)  
 1401. *Liparis liparis* Linnæus. G. N. Eu. (1136)  
 1401b. *Liparis liparis arctica* Gill. (1134)  
 1402. *Liparis ranula* Goode & Bean. N. B. (1137)  
 1403. *Liparis montaguei* Donovan. N. Eu. (1138)  
 1404. *Liparis calliodon* Pallas. A. (1139)  
 1405. *Liparis cyclopus* Günther. A. (1140)

§ *Neoliparis* Steindachner.

1406. *Liparis mucosa* Ayres. C. B. (1141)

<sup>1</sup> *Prionotus ophryas* Jordan & Swain. Proc. U. S. Nat. Mus., 1885. Deep water off Pensacola.

<sup>2</sup> *Prionotus stearnsi* Jordan & Swain, l. c. Deep water off Pensacola, lately discovered by Mr. Silas Stearns.

<sup>3</sup> This species should probably retain the name of *Prionotus evolans*, as adopted in the Synopsis, instead of that of *Prionotus sarritor*, since given it by us (p. 974, Proc. U. S. Nat. Mus., 1882, 615). The type of *Trigla evolans* L., recently examined by Dr. Bean, appears to belong to this species.

<sup>4</sup> *Prionotus strigatus* Cuv. & Val. Described in the Synopsis (p. 736) as *Prionotus evolans lineatus*. Mitchell's name *lineatus*, as stated on page 974, was not given as that of a new species, but through a mistaken identification with the European *Trigla lineata* Bloch.

<sup>5</sup> MONOMITRA Goode.

(Goode, Proc. U. S. Nat. Mus., 1883, 109; type *Amitra liparina* Goode; name a substitute for *Amitra*, preoccupied as *Amitrus*. (*Moros*, lacking; *μιτρα*, stomacher.)

## Family CXXVIII.—CYCLOPTERIDÆ. (110)

456.—**CYCLOPTERICHTHYS** Steindachner. (395)1407. *Cyclopterus ventricosus* Pallas. A. (1142)1408. *Cyclopterus stelleri* Pallas. A. (1143)457.—**EUMICROTREMUS** Gill. (395 b.)1409. *Eumicrotremus spinosus* Müller. A. (1144)458.—**CYCLOPTERUS** Linnaeus. (396)1410. *Cyclopterus lumpus* Linnaeus. N. G. Eu. (1145)

## Family CXXIX.—GOBIESOCIDÆ. (111)

459.—**GOBIESOX** Lacépède. (397)1411. *Gobiesox mæandricus* Girard. C. (1146)1412. *Gobiesox strumosus* Cope. S. (1147)1413. *Gobiesox virgatus* Jordan & Gilbert. S. W. (1147 b.)1414. *Gobiesox rhessodon* Rosa Smith. P. (1148)1415. *Gobiesox adustus*<sup>1</sup> Jordan & Gilbert. P.1416. *Gobiesox zebra*<sup>2</sup> Jordan & Gilbert. P.1417. *Gobiesox erythrops*<sup>3</sup> Jordan & Gilbert. P.1418. *Gobiesox eos*<sup>4</sup> Jordan & Gilbert. P.

## Family CXXX.—BATRACHIDÆ. (112)

460.—**BATRACHUS** Bloch & Schneider. (398)1419. *Batrachus tau* Linnaeus. N. S. W. (1149)1419b. *Batrachus tau pardus* Goode & Bean. S. (1149 b.)461.—**PORICHTHYS** Girard. (399)1420. *Porichthys margaritatus*<sup>5</sup> Richardson. C. (1150)1421. *Porichthys porosissimus*<sup>6</sup> Cuv. & Val. W. (1150 b.)<sup>1</sup> *Gobiesox adustus* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1881, 360. Mazatlan, southward.<sup>2</sup> *Gobiesox zebra* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1881, 359. Mazatlan.<sup>3</sup> *Gobiesox erythrops* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1881, 360. Mazatlan; Tres Marias.<sup>4</sup> *Gobiesox eos* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1881, 360. Mazatlan.<sup>5</sup> *Porichthys margaritatus* (Richardson.)The Pacific species, found from Vancouver's Island to Panama, most abundant northward. The description on page 751 belongs here, and the names *margaritatus* and *notatus*, as also all Pacific coast references to *P. porosissimus*.<sup>6</sup> *Porichthys porosissimus* (Cuv. & Val.)The Atlantic species, found from Surinam to Galveston, Pensacola, and Charleston, distinguished from *P. margaritatus* by the strong, unequal palatine teeth, as described on page 958. The names *porosissimus* and *plectrodon* belong to this species, the only one of its genus yet known from the Atlantic.

## Family CXXXI.—TRICHODONTIDÆ. (102 b.)

462.—**TRICHODON** Steller. (337)1422. *Trichodon trichodon* Tilesius. A. (975)1423. *Trichodon japonicus*<sup>1</sup> Steindachner. A.

## Family CXXXII.—LEPTOSCOPIDÆ. (113)

463.—**DACTYLOSCOPUS** Gill. (400)1424. *Dactyloscopus mundus*<sup>2</sup> Gill. P.1425. *Dactyloscopus pectoralis*<sup>3</sup> Gill. P.1426. *Dactyloscopus tridigitatus* Gill. W. (1151)464.—**MYXODAGNUS**<sup>4</sup> Gill.1427. *Myxodagnus opercularis* Gill. P.

## Family CXXXIII.—URANOSCOPIDÆ. (103)

465.—**UPSILONPHORUS**<sup>5</sup> Gill. (338)1428. *Upsilonphorus y-græcum* Cuv. & Val. S. (976)1429. *Upsilonphorus guttatus* Abbott. N. S. (977)<sup>1</sup> *Trichodon japonicus* Steindachner.

Form of body and coloration of *T. trichodon*. First dorsal high, triangular, formed of ten slender spines, and separated by a long interval from the second dorsal. Preopercle with five sharp spines; the two spines on the preorbital very small. Pectoral well developed, all its rays simple, the lower a little thickened; the fin considerably longer than the head and reaching past the last spine of the dorsal. Anal fin with its rays gradually longer posteriorly. Dentition as in *T. trichodon*, the mouth rather more oblique than in the latter. Head  $3\frac{1}{2}$ : depth  $3\frac{3}{4}$ . D. X-13; A. 31; P. 25; L.  $4\frac{1}{2}$  inches. Strietok, in the sea of Japan, and Sitka, Alaska (Steindachner).

(Steindachner, Ichth., Beitr., X, 4, 1881.)

<sup>2</sup> *Dactylagnus mundus* Gill, Proc. Ac. Nat. Sci. Phila., 1862, 505. Jordan & Gilbert, Proc. U. S. Nat. Mus., 1852, 628. Cape San Lucas to Panama.

We find very small pseudobranchia present in living examples of *Dactyloscopus tridigitatus*. Probably none of the family are wholly destitute of these organs.

<sup>3</sup> *Dactyloscopus pectoralis* Gill, Proc. Ac. Nat. Sci. Phila., 1861, 267. Cape San Lucas.

<sup>4</sup> *MYXODAGNUS* Gill.

(Gill, Proc. Ac. Nat. Sci. Phila., 1861, 269, 270; type *Myxodagnus opercularis* Gill.)

This genus differs from *Dactyloscopus* in the form of the head, which is elongate-conoid, the lower jaw obtusely pointed and provided with a short flap in front. The pseudobranchia are well developed and the dorsal fin commences far behind the nape. One species known. (*Myrodes*, a genus of blennies; *cyrros*, an old name of *Uranoscopus scaber*.) *Myxodagnus opercularis* Gill, l. c., 270. Cape San Lucas.

<sup>5</sup> Instead of genus *Astroscopus* as given in the Synopsis (p. 627) read:

UPSILONPHORUS Gill.

(Gill, Proc. U. S. Nat. Mus., 1861, 113; type *Uranoscopus y-græcum* Cuv. & Val.)

The definition of *Astroscopus* in the text applies entirely to this genus. (*T̄ψιλον*, *v*: *φορεω*, to bear.)

The species of this genus should stand as:

*Upsilonphorus y-græcum* (C. & V.) Gill.

The comparison made on page 941 between *A. y-græcum* and *A. anoplus* should be suppressed, as the specimens there called *anoplus* were the young of *y-græcum*, and the differences noted are the changes produced by age.

*Upsilonphorus guttatus* (Abbott) Gill.

This is the species called *Astroscopus anoplus* by Bean (Proc. U. S. Nat. Mus., 1879, 60) and by us in the text on page 629. The original *anoplus* is, however, very different.

466.—**ASTROSCOPUS**<sup>1</sup> Brevoort.1430. **Astroscopus anoplus** Cuv. & Val. S.Family CXXXIV.—**OPISTHOGNATHIDÆ.** (103 b.)467.—**GNATHYPOPS** Gill. (338 b.)1431. **Gnathypops rhomaleus**<sup>2</sup> Jordan & Gilbert. P.1432. **Gnathypops mystacinus**<sup>3</sup> Jordan. W.1433. **Gnathypops maxillosus** Poey. W.468.—**OPISTHOGNATHUS** Cuv. & Val. (339 b.)1434. **Opistognathus scaphiura** Goode & Bean. W. (977 c.)1435. **Opistognathus lonchura** Jordan & Gilbert. W. (977 d.)1436. **Opistognathus punctata**<sup>4</sup> Peters. P.<sup>1</sup> **ASTROSCOPUS** Brevoort.

(Agnus Günther.)

(Brevoort MSS.; Gill, Proc. Ac. Nat. Sci., Phila., 1860, 20; type *Uranoscopus anoplus*. C. & V.)

This genus is distinguished from *Upsiloniphorus* chiefly by the armature of the head, which is entirely covered above by a rugose coat of mail as in *Uranoscopus*. In other respects it agrees with *Upsiloniphorus*, which should, perhaps, be regarded as a subgeneric section of *Astroscopus*. One species known.

*Astroscopus anoplus* (Cuv. & Val.).

Jet black above and on lower jaw and spinous dorsal; belly and other fins whitish; top of head with no naked areas except at base of premaxillary; cheeks covered with smooth skin except the narrow suborbital and a long slender preorbital strip lying along the maxillary. A transverse depression behind the eyes; occipital ridges prominent, bluish. Humeral spine obsolete; preopercle with two blunt processes, the lower turned downwards and forwards. Scales minute, obsolete below; no intralabial filament. Head as broad as deep; head  $2\frac{1}{2}$ ; depth  $3\frac{1}{4}$ . D. IV-14; A. 13. New York to Key West. No specimens known more than  $2\frac{1}{2}$  inches in length.

*Uranoscopus anoplus* C. & V., VIII, 493, 1831. *Agnus anoplus* Günther, II, 229 (not *Astroscopus anoplus* of most recent authors).

<sup>2</sup> *Opistognathus rhomaleus* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1881, 276. Gulf of California.

<sup>3</sup> *Gnathypops mystacinus* Jordan, Proc. U. S. Nat. Mus., 1884.

<sup>4</sup> *Opistognathus punctatus* Peters, Berliner Monatsberichte, 1869; Jordan, Proc. Ac. Nat. Sci. Phila., 1883, 290. Mazatlan.

Head everywhere finely speckled with black, the body more coarsely and irregularly spotted. Pectoral finely and closely speckled, its edge plain. Ventral fin dusky, similarly marked. Dorsal without large black blotch, finely spotted, the spots behind gradually forming the boundaries of white ocelli, the base of the fins having rings of white around black spots, the upper part with dark rings around pale spots. Caudal with pale spots, its edge, like that of the dorsal, somewhat dusky, not black. Anal with a broad, blackish edge, and with dark spots, those near the base of the fin largest. Lining membrane of maxillary with the usual bands of white and inky black.

Scales very small, about 125 in lateral line. Dorsal spines continuous with the soft rays. D. 28; A. 18. No vomerine teeth. Maxillary very long, extending slightly beyond head.

Only the type of this species is yet known.

## Family CXXXV.—CHIASMODONTIDÆ. (120 b.)

469.—**CHIASMODON** Johnson. (446)

- 1437.
- Chiasmodon niger**
- Johnson. B. (1250)

## Family CXXXVI.—BLENNIIDÆ. (114)

470.—**OPHIOBLENNIUS** Gill. (401)

- 1438.
- Ophioblennius webbi**
- Valenciennes. W.P. (1152)

471.—**CHASMODES** Cuv. & Val. (402)

- 1439.
- Chasmodes bosquianus**
- Lacépède. S. (1153)

- 1440.
- Chasmodes quadrifasciatus**
- Wood. S. (1154)

- 1441.
- Chasmodes saburrae**
- Jordan & Gilbert. S. (1154 b.)

472.—**HYPSOBLENNIUS**<sup>1</sup> Gill. (403)

- 1442.
- Hypsobleunius brevipinnis**
- <sup>2</sup>
- Günther. P.

- 1443.
- Hypsobleunius gentilis**
- Girard. C.P. (1155 b.)

- 1444.
- Hypsobleunius gilberti**
- Jordan. C. (1155)

- 1445.
- Hypsobleunius punctatus**
- <sup>3</sup>
- Wood. S. (1156, 1156 b.)

- 1446.
- Hypsobleunius ionthas**
- Jordan & Gilbert. S. (1156 c.)

- 1447.
- Hypsobleunius scrutator**
- Jordan & Gilbert. S. (1156 d.)

473.—**HYPLEUROCHILUS** Gill. (404)

- 1448.
- Hypleurochilus multifilis**
- Girard. S. (1157)

- 1449.
- Hypleurochilus geminatus**
- Wood. S. (1158)

474.—**BLENNIUS** Linnæus. (405)§ *Blennius*.

- 1450.
- Blennius stearnsi**
- <sup>4</sup>
- Jordan & Gilbert. W. (1159 b.)

- 1451.
- Blennius favosus**
- Goode & Bean. W. (1159 c.)

- 1452.
- Blennius asterias**
- Goode & Bean. W. (1159 d.)

§ *Pholis* Cuv. & Val.

- 1453.
- Blennius carolinus**
- Cuv. & Val. S. (1160)

<sup>1</sup> The generic name *Hypsobleunius* Gill (Cat. Fish. East Coast U. S., 1861; *H. hentzi*) introduced without definition or explanation is equivalent to *Isesthes* Jordan & Gilbert. If it be thought best to adopt such *nomina nuda*, *Hypsobleunius* has precedence over *Isesthes*.

<sup>2</sup> *Blennius brevipinnis* Günther, Cat. Fishes, III, 226. Mazatlan, southward. This species is a genuine *Isesthes*, as is also the *Blennius striatus* of Steindachner, from Panama.

<sup>3</sup> *Isesthes hentzi* should be erased. It is identical with *Isesthes punctatus*, as given on page 758 of the Synopsis.

<sup>4</sup> *Blennius fucorum* should be erased. It is a tropical species introduced into our faunal lists by DeKay, on information which was probably erroneous.

475.—**RUPISCARTES** Swainson.<sup>1</sup>1454. **Rupiscartes chiostictus**<sup>2</sup> Jordan & Gilbert. P.1455. **Rupiscartes atlanticus**<sup>3</sup> Cuv. & Val. P. W.476.—**EMBLEMARIA**<sup>4</sup> Jordan & Gilbert.1456. **Emblemaria nivipes** Jordan & Gilbert. W. P.477.—**NEOCLINUS** Girard. (406)1457. **Neoclinus satiricus** Girard. C. (406)1458. **Neoclinus blanchardi** Girard. C. (1162)478.—**LABROSOMUS** Swainson.1459. **Labrosomus nuchipinnis** Quoy & Gaimard. W. (1163)1459b. **Labrosomus nuchipinnis xanti**<sup>5</sup> Gill. P.1460. **Labrosomus zonifer**<sup>6</sup> Jordan & Gilbert. P.<sup>1</sup> **RUPISCARTES** Swainson.(Swainson, Class'n Anim., 1839, II, 275; type *Salarias alticus* C. & V.)

As here understood, this genus differs from *Blennius*, in having the teeth in the jaws slender and movable. From the genus *Salarias* Cuv. (type *S. quadripinnis* Cuv.), which has the same dentition, and to which genus its species have been usually referred, it differs in the presence of posterior canines. Species numerous, in tide pools of the tropics. (Latin, *rupis*, rock; *σκάρπης*, a leaper; "it is said to jump on the sea-rocks like a lizard"; *Swainson*.)

<sup>2</sup> *Salarias chiostictus* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1881, 363. Mazatlan.<sup>3</sup> *Salarias atlanticus* Cuv. & Val., XI, 321; Günther, III, 242. Tropical America, on both coasts, north to Cape San Lucas.<sup>4</sup> **EMBLEMARIA** Jordan & Gilbert.(Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 627; type *Emblemaria nivipes* Jordan & Gilbert.)

Body moderately elongate, not compressed, naked. Ventrals jugular, I, 2. Dorsal fin continuous, beginning at the nape, not confluent with the caudal. Spines and soft rays similar, both much elevated. Head cuboid, formed much as in *Opistognathus*. Lower jaw very acute at symphysis. A single series of strong, blunt, conical teeth on each jaw and on vomer and palatines. Teeth of vomer and palatines larger, forming a uniform curve. No cirri. Gill openings very wide, the membranes broadly united below, free from the isthmus. One species known. (*Emblema*, a banner (emblem); from the elevated fins.)

*Emblemaria nivipes* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 627.

Originally described from the Pearl Islands (Panama). A specimen which we cannot distinguish from this species was obtained at Pensacola by Mr. Silas Stearns. See Proc. U. S. Nat. Mus., 1884.

<sup>5</sup> *Labrosomus xanti* Gill, Proc. Ac. Nat. Sci. Phila., 1860, 107; *Clinus xanti* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 368. Gulf of California, southward. The genus *Labrosomus*, as here understood, differs from *Clinus* chiefly in the absence of the upturned spine-like process on the inner edge of the shoulder girdle, characteristic of the latter genus and *Heterostichus*. This process is found on *Clinus acuminatus*, the type of the genus *Clinus*.

<sup>6</sup> *Clinus zonifer* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1881, 361. Mazatlan.

479.—**TRIPTYERYGION**<sup>1</sup> Risso.1461. **Tripterygion carmineale**<sup>2</sup> Jordan & Gilbert. P.480.—**CLINUS** Cuv. & Val. (407)§ *Gibbonsia* Cooper.1462. **Clinus evides** Jordan & Gilbert. C. (1164)481.—**HETEROSTICHUS** Girard. (408)1463. **Heterostichus rostratus** Girard. C. (1165)482.—**CREMNOBATES** Günther. (409)1464. **Cremnobates altivelis**<sup>3</sup> Lockington. P.1465. **Cremnobates marmoratus** Steindachner. W. (1166b.)1466. **Cremnobates fasciatus**<sup>4</sup> Steindachner. W.1467. **Cremnobates affinis**<sup>5</sup> Steindachner. W.<sup>1</sup> **TRIPTYERYGION** Risso.

(Risso, Europe Méridion. 1826, III, 241; type *Blennius tripteronotus* Risso.) This genus is allied to *Clinus*, differing chiefly in the division of the dorsal fin into three nearly or quite separate fins, the anterior of 3 to 6 spines, the median one of many spines and the last of many soft rays. Warm seas in tide-pools. (*Tρεῖς*, three; *πτερύγιον*, fin.)

<sup>2</sup> *Tripterygium carmineale* Jordan & Gilbert, Proc. U. Nat. Mus., 1881, 362. Mazatlan to Panama.

<sup>3</sup> *Cremnobates altirelis* Lockington, Proc. Ac. Nat. Sci. Phila., 1881. Gulf of California.

<sup>4</sup> *Cremnobates fasciatus* Steindachner.

Light pinkish-brown, much mottled, and with 6 or 8 darker bars; sides of head marbled with whitish, its cirri pale; 3 black spots behind and below eye; dorsal pale, with 9 blackish blotches extending from the bands on the sides; in the next the last of these is a large blue-black spot ocellated with orange; anal with 5 dark blotches and no ocellus; a dark band across base of caudal; caudal otherwise pale yellowish with dark dots. Pectorals whitish, barred with black; its base with a whitish area; with a brown center, below which is a small black spot. Ventrals barred. Body rather slender, a little deeper than as in *C. integrifinnis*, the snout less acute than in *C. marmoratus*. First dorsal spine rather higher than second, and lower than the spines of posterior part of fin; membrane of third spine joining second dorsal at a point above its base, the two parts of the fin therefore separated only by an emargination. Tentacle above eye slender, small; cirri on side of occiput bluish. Head 4; depth 4½. D. III, 24, 1. A. II, 18. Lat. 1. 37. L. 2 inches. Florida Straits; north to Key West.

(Steindachner, Ichth. Beitr, V, 1876, 176). For a comparison of our species of *Cremnobates*, see Jordan, Proc. U. S. Nat. Mus., 1884, 142.)

<sup>5</sup> *Cremnobates affinis* Steindachner.

Dark brown, paler than in *C. norx*, but darker and more uniform than in *C. fasciatus*; lower side of head pearly gray, thickly speckled with darker; sides with 5 very faint darker cross-bands; dorsal and anal dusky, the latter with a pale edge; between the 18th and 22d dorsal spines a large dark spot ocellated with yellowish; caudal yellowish white, with darker cross-streaks; a blackish band at its base; pectoral dusky at base, its posterior half yellowish, with darker cross-streaks; ventral similar. A wedge-shaped whitish band extending backward from eye to opercle. Form of *C. integrifinnis*; maxillary reaching to below posterior margin of eye; a fringed tentacle above eye and one on each side of occiput. First dorsal low, its longest (second) ray

1468. *Cremnobates integrifinnis* Rosa Smith. C. P. (1166)  
 1469. *Cremnobates nox*<sup>1</sup> Jordan & Gilbert. W.

483.—**CHIROLOPHUS** Swainson. (410)

1470. *Chirolophus polyactocephalus*<sup>2</sup> Pallas. A. (1167)

484.—**MURÆNOIDES**<sup>3</sup> Lacépède. (411)

1471. *Murænoides gunnellus* Linnaeus. N. G. Eu. (1168)  
 1472. *Murænoides fasciatus* Bloch & Schneider. G. (1169)  
 1473. *Murænoides ornatus* Girard. A. (1170)  
 1474. *Murænoides maxillaris* Bean. A. (1171)  
 1475. *Murænoides dolichogaster* Pallas. H. (1172)

485.—**APODICHTHYS** Girard. (412)

1476. *Apodichthys flavidus* Girard. C. (1174)  
 1477. *Apodichthys fucorum* Jordan & Gilbert. C. (1175)  
 1478. *Apodichthys univittatus*<sup>4</sup> Lockington. P.

486.—**ANOPLARCHUS** Gill. (413)

1479. *Anoplarchus atropurpureus*<sup>5</sup> Kittlitz. C. A. (1176)

487.—**XIPHISTER** Jordan. (414)

1480. *Xiphister chirurgus* Jordan & Gilbert. C. (1178)  
 1481. *Xiphister mucosus*<sup>6</sup> Girard. C. (1179)  
 1482. *Xiphister rupestris* Jordan & Gilbert. C. (1180)

488.—**CEBEDICHTHYS** Ayres. (415)

1483. *Cebedichthys violaceus* Girard. C. (1181)

489.—**EUMESOGRAMMUS** Gill. (416)

1484. *Eumesogrammus præciscus* Kröyer. G. (1182)  
 1485. *Eumesogrammus subbifurcatus* Storer. N. (1183)

490.—**STICHÆUS** Reinhardt. (417)

1486. *Stichæus punctatus* Fabricius. G. (1184)

shorter than the highest of second dorsal; membrane of third spine joining the fourth spine just above its base. Last ray of second dorsal joined by membrane to base of caudal. Head 4; depth 4 $\frac{3}{4}$ , D. III, 27, I. A. II, 19. V. 1, 2. Lat. 1. 33 to 35. Key West; St. Thomas.

(Steindachner, Ichthyologische Beiträge, V, 178, 1876. Jordan, l. c., 142.)

<sup>1</sup> *Cremnobates nox* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1884, 30. Key West.

<sup>2</sup> *Blennius polyactocephalus* Pallas, lately rediscovered by Mr. Nelson in Alaska, proves to be, as supposed in the Synopsis, a genuine species of *Chirolophus*.

<sup>3</sup> I here omit *Muranoides* (*Asternopteryx*) *gunnelliformis*. It is not certain that the single known specimen is a *Muranoides* or that it is from American waters.

<sup>4</sup> *Apodichthys univittatus* Lockington, Proc. Ac. Nat. Sci. Phila., 1881, 118. Gulf of California.

<sup>5</sup> *Anoplarchus electrophorus* should not have been inserted. It is an Asiatic species, not found within our limits.

<sup>6</sup> The type of *Xiphidium cruentum* Cope, examined by Mr. Meek, is identical with *X. mucosus*.

## 491.—NOTOGRAMMUS Bean. (418)

1487. *Notogrammus rothrocki* Bean. A. (1185)

## 492.—LEPTOCLINUS Gill.

1488. *Leptoclinus maculatus* Fries. G. (1186)

## 493.—LUMPENUS Reinhardt. (419)

1489. *Lumpenus medius* Reinhardt. G. (1187)1490. *Lumpenus anguillaris* Pallas. A. (1188)1491. *Lumpenus lumpenus* Müller. G. (1189)

## 494.—LEPTOLENNIUS Gill. (420)

1492. *Leptoblennius nubilus* Richardson. G. (1190)1493. *Leptoblennius serpentinus* Storer. N. (1191)1494. *Leptoblennius lampetraeformis* Walbaum. G. (1192)495.—PHOLIDICHTHYS<sup>1</sup> Bleeker.1495. *Pholidichthys anguilliformis* Lockington. P.Family CXXXVII.—CRYPTACANTHODIDÆ.<sup>2</sup>

## 496.—DELOLEPIS Bean. (421)

1496. *Delolepis virgatus* Bean. A. (1193)

## 497.—CRYPTACANTHODES Storer. (422)

1497. *Cryptacanthodes maculatus* Storer. N. (1194)Family CXXXVIII.—ANARRHICHADIDÆ.<sup>2</sup>

## 498.—ANARRHICHAS Linnæus. (423)

1498. *Anarrhichas lupus* Linnæus. N. Eu. (1195)1499. *Anarrhichas minor* Olafsen. G. Eu. (1196)1500. *Anarrhichas latifrons* Steenstrup & Halgrímsson. G. Eu. (1197)1501. *Anarrhichas lepturus* Bean. A. (1198)

## 499.—ANARRHICHTHYS Ayres. (424)

1502. *Anarrhichthys ocellatus* Ayres. C. (1199)<sup>1</sup> PHOLIDICHTHYS Bleeker.(Bleeker, Boeroe, 406; type *Pholidichthys leucotenia* Bleeker.)Body elongate, tapering, naked; snout obtuse; no cirri. Teeth unequal, on jaws only. Dorsal, anal, and caudal fins distinct, but connected by membrane, the dorsal formed of flexible spines. Ventrals inserted scarcely before the pectorals, of two rays. Two species known, of the tropical parts of the Pacific. (*Φολίς*, Pholis; *ἰχθύς*, fish.)*Pholidichthys anguilliformis* Lockington, Proc. Ac. Nat. Sci. Phila., 1831, 118. Dredged off Amortiguado Bay, Gulf of California.<sup>2</sup> There seems to be no doubt that the families of *Cryptacanthodidae* and *Anarrhichadidae* at least, should be detached from the *Blenniidae*. Whether the latter group should be further subdivided or not, I am not certain. In the northern types (*Xiphisterinae*, *Stichaeinae*) the vertebræ are much more numerous than in the tropical *Clininae* and *Blenniinae*.

## Family CXXXIX.—LYCODIDÆ. (115)

## 500.—ZOARCES Cuvier. (425)

1503. *Zoarces anguillaris* Peck. N. G. (1200)

## 501.—LYCODOPSIS Collett. (426)

1504. *Lycodopsis pacificus* Collett. C. A. (1201)1505. *Lycodopsis paucidens* Lockington. C. (1202)502.—LYCODONUS<sup>1</sup> Goode & Bean.1506. *Lycodonus mirabilis* Goode & Bean. B.503.—LYCENCHELYS<sup>2</sup> Gill.1507. *Lycenchelys paxillus* Goode & Bean. B. (1203)1508. *Lycenchelys paxilloides*<sup>3</sup> Goode & Bean. B.1509. *Lycenchelys verrilli* Goode & Bean. B.

## 504.—LYCODES Reinhardt. (427)

1510. *Lycodes vahli* Reinhardt. B. G. (1205)1511. *Lycodes esmarki* Collett. B. G. Eu. (1206)1512. *Lycodes reticulatus* Reinhardt. B. G. (1207)1513. *Lycodes seminudus* Reinhardt. B. G. (1208)1514. *Lycodes nebulosus* Reinhardt. G. (1209)1515. *Lycodes coccineus* Bean. A. (1210)<sup>1</sup> LYCODONUS Goode & Bean.(Goode & Bean, Bull. Mus. Comp., Zoöl., XIX, 1883, 208; type *Lycodonus mirabilis* Goode & Bean.)Body elongate, formed as in *Lycenchelys*. Scales small, circular, imbedded in the skin; lateral line very short, obsolete posteriorly. Jaws without fringes, lower jaw included. Fin rays all articulated, each ray of dorsal and anal supported laterally by a pair of sculptured scutes. Caudal distinct, not fully connate with dorsal and anal. Ventrals present. Gill opening narrow. Teeth as in *Lycodes*. Deep water (*Lycodes*; *Onos*).*Lycodonus mirabilis* Goode & Bean.Form of *Lycenchelys verrilli*, very slender; head, nape, and fins scaleless; maxillary reaching front of pupil. Dorsal inserted slightly behind base of pectorals. Length of pectorals 3 times snout. Eye  $2\frac{1}{2}$  in head,  $3\frac{1}{2}$  times interorbital width. Head 7; depth 18. D. 80+. A. 70+. Gulf Stream, lat.  $40^{\circ}$ .

(Goode &amp; Bean, Bull. Mus. Comp. Zoöl., XIX, 1883, 208.)

<sup>2</sup> LYCENCHELYS Gill.(Gill, Proc. Ac. Nat. Sci., Phila., 1884, 180; type *Lycodes muræna* Collett.)This name *Lycenchelys* may be used for Collett's second group, which have the body elongate; height of the body contained from 12 to 24 times in the total length (Gill). (*Αύκος*, wolf; *εγχελυς*, eel.)<sup>3</sup> *Lycenchelys paxilloides* Goode & Bean.Light brown, the head somewhat darker. Form of *L. paxillus*, but with a smaller mouth and less prominent cheeks. Dorsal beginning over tip of pectoral; ventral little longer than pupil. Scales very small, present everywhere except on head and pectorals, nearly covering vertical fins. Eye  $3\frac{1}{2}$  in head, equal to snout, which is 4 times interorbital width. Head 8, depth 16. D. (with half caudal) 118. A. 110. P. 16. V. 3. Gulf Stream, lat.  $40^{\circ}$ , in deep water (Goode & Bean).(*Lycodes paxillus* Goode & Bean. Bull. Mus. Comp. Zoöl., XIX, 1883, 207.)

505.—**LYCODALEPIS** Bleeker. (428)

1516. *Lycodalepis mucosus* Richardson. G. (1211)  
 1517. *Lycodalepis turneri* Bean. A. (1212)  
 1518. *Lycodalepis polaris* Sabine. G. (1213)

506.—**GYMNELIS** Reinhardt. (429)

1519. *Gymnelis viridis*<sup>4</sup> Fabricius. G. A. (1214, 1215?)

507.—**LYCOCARA**<sup>2</sup> Gill. (430)

1520. *Lycocara parrii* Ross. G. (1216)

508.—**MELANOSTIGMA**<sup>3</sup> Günther.

1521. *Melanostigma gelatinosum* Günther. B.

Family CXL.—**CERDALIDÆ**.<sup>4</sup>509.—**MICRODESMUS**<sup>5</sup> Günther.

1522. *Microdesmus dipus* Günther. P.

I here omit *Gymnelis stigma*. It is probably based on an inaccurate description of *Gymnelis viridis*. If, however, really possessing scales, it may belong to the Antarctic genus *Maynea* (Cunningham), which differs from *Lycodes* chiefly in the absence of ventrals.

<sup>5</sup> **LYCOCARA** Gill.

(Gill, Proc. Ac. Nat. Sci. Phila., 1884, 180; type *Ophidium parrii* Ross.)

This name is a substitute for *Uronectes*, which is preoccupied. (*Aυκος*, wolf; *κάρα*, head.)

<sup>3</sup> **MELANOSTIGMA** Günther.

(Günther, Proc. Zoöl. Soc. Lond., 1881, 21; type *Melanostigma gelatinosum* Günther.)

Allied to *Gymnelis*: "technically distinguished by the much more elongate teeth, which in the jaws, as well as on the vomer and palatines, stand in single series." Gill openings much smaller than in related forms, reduced to a small foramen above the base of the pectoral. Skin loose and movable, as in *Liparis*, enveloping the vertical fins; pectorals very small; ventrals, none. Body tapering very rapidly backward; the tail very slender. Deep sea. (*Μελας*, black; *στιγμα*, spot.)

*Melanostigma gelatinosum* Günther.

Purplish above; sides grayish, marbled with darker, the end of the tail almost black. Head large, deep, compressed; the snout blunt. Eye large,  $3\frac{1}{2}$  in head, longer than snout. Cleft of mouth oblique, the maxillary reaching a little past front of pupil, the lower jaw not projecting. Inside of mouth, gill openings and vent black. Dorsal beginning above middle of pectoral, low in front, becoming higher than the part of the body below it posteriorly. Head  $6\frac{1}{2}$ . Deep waters of the Atlantic; Martha's Vineyard; Straits of Magellan.

(Günther, Proc. Zoöl. Soc. London, 1881, 21; Goode & Bean, Bull. Comp. Zoöl., XIX, 1883, 209.)

<sup>4</sup> I suggest the provisional name *Cerdalidae* for two closely related genera, *Cerdale* Jordan & Gilbert, and *Microdesmus* Günther, which seem to be allied to the *Lycodidae*, differing in the small, slit-like gill openings and in the non-isocercal tail. The three known species are scantily represented in collections, and until their osteology is examined we cannot be sure as to their relation to the *Lycodidae*, *Congrogadidae*, and *Brotulidae*.

<sup>5</sup> **MICRODESMUS** Günther.

Günther, Proc. Zool. Soc., London, 1864, 26; type *Microdesmus dipus* Günther.)

Body anguilliform, covered with rudimentary scales. Head small, with short snout and small mouth; lower jaw projecting. Teeth minute, in jaws only. Gill opening reduced to a very narrow, somewhat oblique slit, in front of lower part of pectorals. Vertical fins well developed, the dorsal and anal joined to the caudal by a thin mem-

## Family CXLI.—CONGROGADIDÆ. (116)

510.—**SCYTALISCUS**<sup>1</sup> Jordan & Gilbert. (431)**1523.** *Scytaliscus cerdale* Jordan & Gilbert. A. (1217)

## Family CXLII.—FIERASFERIDÆ. (117)

511.—**FIERASFER** Cuvier. (432)**1524.** *Fierasfer dubius*<sup>2</sup> Putnam. P. W. (1218)

## Family CXLIII.—OPHIDIIDÆ. (118)

512.—**OPHIDION** Linnæus. (433)**1525.** *Ophidion marginatum*<sup>3</sup> Dekay. S. W. (1219, 1220)**1526.** *Ophidion holbrooki* Putnam. W. (1221)**1527.** *Ophidion beani*<sup>4</sup> Jordan. W. (1221 b.)513.—**OTOPHIDIUM**<sup>5</sup> Gill. (433 b.)**1528.** *Otophidium taylori* Girard. C. (1222)**1529.** *Otophidium omostigma* Jordan & Gilbert. W. (1223 b.)514.—**LEPTOPHIDIUM** Gill.**1530.** *Leptophidium profundorum* Gill. W. B. (1223)Family CXLIV.—BROTULIDÆ.<sup>6</sup> (119)515.—**BYTHITES** Reinhardt. (434)**1531.**—*Bythites fuscus* Reinhardt. G. (1224)

brane. Tail not isocereal. Rays of dorsal all articulate; all but a few of the last simple. Ventral fins very small, reduced to a single ray. Pectorals moderate. Vent normal. Pacific coast of tropical America. (*Mixpos*, small; *δεσμος*, a band.)

*Microdesmus dipus* Günther, l. c.

Gulf of California to Panama. The two remaining species of this family, *Microdesmus retropinnis* and *Cerdale ionthas*, both from Panama, are described by Jordan & Gilbert, Bull. U. S. Fish Comm., 1881, 331.

<sup>1</sup> *SCYTALISCUS* Jordan & Gilbert.

Proc. U. S. Nat. Mus., 1883, 111; name a substitute for *Seytalina*, preoccupied in *Coleoptera* as *Scytalina* Erichson. It is doubtful whether this genus is really an ally of *Congrogadus*.

<sup>2</sup> *Fierasfer dubius* Putnam = *Fierasfer arenicola* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1881, 363. Mazatlan. See Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 629.

*Ophidium josephi* Girard and *Ophidium gräellsii* Poey (not of Jor. & Gilb.) seem to be identical with *O. marginatum*.

<sup>4</sup> The species described in the Synopsis as *Ophidium gräellsii* should stand as *Ophidion beani* Jordan & Gilbert. See Proc. U. S. Nat. Mus., 1883, 143.

<sup>5</sup> *OTOPHIDIUM* Gill, gen. nov.

Type *Genypterus omostigma* Jordan & Gilbert. This genus differs from *Ophidium* in the presence of a sharp concealed spine on the opercle. The typical species has been wrongly referred to *Genypterus*.

<sup>6</sup> The Brotuline genera (*Bythites* and *Dinematichthys*) have been erroneously placed in the Synopsis among the *Gadidae*. For the characters of the *Brotulidae* see Gill, Proc. Ac. Nat. Sci. Phila., 1863, 252; 1864, 200, and 1884, 169, 175. These fishes are certainly much nearer the *Ophidiidae*, or even the *Lycadidae*, than the *Gadidae*.

516.—**DINEMATICHTHYS** Bleeker. (435)

§ *Brosmophycis* Gill.

**1532. Dinematichtys marginatus** Ayres. C. (1225)

**1533. Dinematichtys ventralis**<sup>1</sup> Gill. P.

517.—**BARATHRODEMUS**<sup>2</sup> Goode & Bean.

**1534. Barathrodemus manatinus** Goode & Bean. B.

518.—**DICROLENE**<sup>3</sup> Goode & Bean. B.

**1535. Dicrolene intronigra** Goode & Bean. B.

<sup>1</sup> *Brosmophycis ventralis* Gill, Proc. Ac. Nat. Sci. Phila., 1863, 253. Cape San Lucas, southward.

<sup>2</sup> **BARATHRODEMUS** Goode & Bean.

(Goode & Bean, Bull. Mus. Comp. Zoöl., XIX, 1883, 200; type *Barathrodemus manatinus* G. & B.)

Body brotuliform, much compressed; head compressed; mouth moderate. Head unarmed, except for a short flattened spine at upper angle of opercle. Snout long, projecting far beyond premaxillaries, its tip much swollen; jaws subequal in front. Teeth minute, in villiform bands on jaws, vomer and palatines. No barbels. Anterior nostrils on the outer angles of the dilated snout, circular, each surrounded by a cluster of mucous tubes. Posterior nostrils above front of eye. Gill openings wide, the membranes not united. Gill-rakers rather few. Body and head covered with small, thin, scarcely imbricated scales. Dorsal and anal long. Caudal fin separate, long, and slender. Ventrals close together, far in front of pectorals, each reduced to a single bifid ray. Deep-sea fishes. (*βάραθρον*, a gulf or deep abyss; *δῆμος*, people.)

*Barathrodemus manatinus* Goode & Bean.

Grayish brown; abdomen black. Snout longer than eye, its form resembling that of the manatee. Maxillary reaching to opposite front of eye, its length  $2\frac{1}{2}$  in head. Eye  $5\frac{1}{2}$  in head. Insertion of dorsal above that of pectoral. Ventrals inserted nearly below middle of opercle, their length half head. Head 6; depth  $7\frac{1}{2}$ . D. 106; A. 86; C + 5 +; Lat. l. 175. Gulf Stream, latitude  $33^{\circ}$ . (Goode & Bean.)

(Goode & Bean, Bull. Mus. Comp. Zoöl., XIX, 1883, 200.)

<sup>3</sup> **DICROLENE** Goode & Bean.

(Goode & Bean, Bull. Mus. Comp. Zoöl., 1883, 202, XIX; type *Dicrolene introniger* G. & B.)

Body brotuliform, moderately compressed; head somewhat compressed, the mouth large; tip of maxillary much dilated. Eye large, placed high. Head with supr orbital spines; several strong spines on the preopercle and one long spine at upper angle of opercle. Snout short, not projecting; jaws subequal. Teeth in narrow, villiform bands on jaws, head of vomer, and on palatines. No barbel. Gill membranes separate. Caudal fin small, separate. Dorsal and anal fins long. Pectoral with several of its lower rays separate and very much produced. Ventrals close together, under front of operculum, each composed of a single bifid ray. Head and body covered with small scales. Lateral line incomplete. Stomach siphonal; pyloric cæca rudimentary; intestine short. Deep water. (*Δικρόεος*, forked; *ώλενη*, arm.)

*Dicrolene introniger* Goode & Bean.

Opercular spine with its exposed portion half as long as eye, which is as wide as interorbital space, and 4 in head. Mouth large, the maxillary extending beyond eye, its length considerably more than half head; width of expanded tip of maxillary  $\frac{3}{4}$  eye. Bones of head with large muciferous cavities. Length of caudal half distance from

519.—**BASSOZETUS** Gill.<sup>1</sup>1536. **Bassozetus normalis** Gill. B.Family CXLV.—**GADIDÆ.** (120)520.—**RHINONEMUS** Gill.1537. **Rhinonemus cimbrius** Linnæus. N. Eu. (1226)521.—**ONOS**<sup>2</sup> Risso. (436)1538. **Onos reinhardti** Kröyer. G. (1227)1539. **Onos ensis** Reinhardt. G. (1228)1540. **Onos rufus**<sup>3</sup> Gill. B.1541. **Onos septentrionalis**<sup>4</sup> Collett. G. Eu.

snout to front of dorsal. Eight lower rays of pectorals free, much prolonged, the longest and most anterior being nearly one-third length of body and more than three times length of the nearest of the normal rays, which are, however, about equal to the least of the free rays; normal rays of pectorals 4 in body. Head 5; depth 6. D. 100; A. ca. 85, C. 7; P. 19 + 7; Lat. I. ca. 115. Gulf Stream, latitude 34°. (Goode & Bean.)

(Goode &amp; Bean, l. e. 202.)

<sup>1</sup> **BASSOZETUS** Gill.(Gill, Proc. U. S. Nat., Mus., 1883, 259; type *Bassozetus normalis* Gill.)

"Dinematicithyine brotulids with a slender body; a narrow differentiated caudal fin; anus about a third of the total length from the snout; small eyes, and unarmed head and shoulders." Deep sea. (Βάσσων, deep; οὗτως, seeker.)

*Bassozetus normalis* Gill. Deep water; latitude 39°.

(Gill, l. e. 259.)

The descriptions, generic and specific in this paper, "Diagnoses of new Genera and Species of Deep-sea Fish-like Vertebrates," are among the most brief and unsatisfactory in our ichthyological literature. This paper, by a most able and competent ichthyologist, from the brief and superficial character of its descriptions, is likely to cause great confusion in the study of the Bassalian fauna of the Atlantic, unless soon followed by accurate and sufficient descriptions.

<sup>2</sup> "The *Lotinor*, and apparently the *Onina*, have doubled or paired frontals. \* \* \* It seems probable that they may be segregated in a peculiar family." Gill, Proc. Ac. Nat. Sci. Phila., 1884, 172.

<sup>3</sup> *Onos rufus* Gill.

Color in life almost uniform salmon or brick-red; barbels three; enlarged dorsal ray not shorter than head; some enlarged brown-colored teeth developed in the exterior row. Closely allied to *O. ensis*, but apparently different in color. Deep sea, latitude 40°. (Gill.)

(Gill, Proc. U. S. Nat. Mus., 1883, 259.)

<sup>4</sup> *Onos septentrionalis* Collett.

Three barbels, two at the nostrils, one at the chin, besides a row of about eight shorter rudimentary barbels along the edge of the upper lip; eye small, half length of snout; cleft of mouth extending far beyond eye, its length nearly equal to that of postorbital part of head; teeth rather small, unequal; outer teeth of upper jaw and some of the inner teeth of lower enlarged; first ray of first dorsal short, about as long as snout; vent midway between tip of snout and last anal ray; lateral line with about 20 large pores, grayish brown, paler below; cavity of mouth white. D. 50; A. 42; P. 16. Coast of Norway; one specimen known from Greenland. (Collett.)

(*Motella septentrionalis* Collett, Ann. Mag. Nat. Hist., 15, 82, 1874; *Onos septentrionalis* Collett, Norske Nord-Hav Exped., 1880, 139.)

522.—**LOTA** Cuvier. (441)1542. **Lota lota maculosa** Le Sueur. Vv. En. (1236)523.—**PHYCIS** Bloch & Schneider. (437)1543. **Phycis regius** Walbaum. N. S. (1229)1544. **Phycis floridanus**<sup>1</sup> Bean & Dresel. S.1545. **Phycis earlli** Bean. S. (1230)1546. **Phycis chuss** Walbaum. N. (1231)1547. **Phycis tenuis** Mitchell. N. (1232)1548. **Phycis chesteri** Goode & Bean. B. (1233)524.—**LÆMONEMA**<sup>2</sup> Günther.1549. **Læmonema barbatula** Goode & Bean. B.525.—**ANTIMORA**<sup>3</sup> Günther. (438)1550. **Antimora viola** Goode & Bean. B. (1233 b.)<sup>1</sup> *Phycis floridanus* Bean & Dresel.

In general appearance it resembles *P. regius*, differing from this in its smaller scales and more numerous dorsal rays. The greatest height is one-fifth of the total length to caudal base, and equals four-fifths of the length of head. Head 4 times in length to caudal base; eye slightly less than snout, 5 times in length of head; maxilla slightly less than mandible, one-half length of head. First dorsal not produced; ventral about five-fourths length of head; pectoral equal to head in length. Dorsal 13, 57; Anal, 49. Scales between first dorsal and lateral line in nine or ten rows; about 120 scales in the lateral line; L.  $7\frac{1}{2}$  inches. Pensacola. (Bean & Dresel.)

(Bean &amp; Dresel, Proc. Biol. Soc. Wash., 1884, 100.)

<sup>2</sup> *Læmonema* Günther.(Günther, IV, 356, 1862; type *Phycis yarrelli* Lowe.)

This genus is scarcely distinct from *Phycis*, differing chiefly in the character of the first dorsal, which is composed of five rays only, the anterior ray being filamentous. Deep water. (*Δαμος*, throat; *νήνη*, thread.)

*Læmonema barbatula* Goode & Bean.

Color of species of *Phycis*; dorsal and anal with narrow black margins. Eye 3 in head; upper jaw a little more than 2; barbel half as long as eye; vent under 6th ray of spinous dorsal; first ray of first dorsal elongate, about 3 times length of caudal, about reaching 24th ray of second dorsal. Distance from snout to front of anal twice length of head; ventrals as long as pectorals, not reaching vent; scales small, very thin, deciduous. D. 5-63. A. 59. P. 19. V. 2. Scales 13-140, 31. L. 7 inches. Gulf Stream, latitude 32°, in deep water. (Goode & Bean.)

*(Læmonema barbatula* Goode & Bean, Bull. Mus. Comp. Zool., XIX, 204.)

<sup>3</sup> *Haloporphyrus viola* belongs to the subgenus *Antimora* (Günther, Ann. Mag. Nat. Hist., 1878, 2; type *Haloporphyrus rostratus* Günther). This group differs from *Haloporphyrus* "in the form of the snout, the backward position of the vent, the imperfect division of the anal, in which latter respect it approaches *Mora*." In *Haloporphyrus* the snout is subconical, obtusely rounded; in *Antimora* it forms a flat, triangular lamina, sharply keeled at the sides, resembling the snout of *Macrurus*. The diagnosis of *Haloporphyrus* given in the Synopsis (p. 800) applies to *Antimora* and not to *Haloporphyrus*.

In the very brief description of *Haloporphyrus rostratus* Günther, l. c. (from the mid-Atlantic east of Rio de la Plata), there is nothing by which our species can be distinguished from it. It is probable that the two will prove identical. *A. rostrata* has five months' priority in date over *A. viola*.

526.—**PHYSICULUS**<sup>1</sup> Kaup. (439)1551. **Physiculus fulvus** Bean. B.527.—**LOTELLA**<sup>2</sup> Kaup.1552. **Lotella maxillaris** Bean. B.528.—**MOLVA** Nilsson. (440)1553. **Molva molva** Linnaeus. G. Eu. (1235)529.—**BROSMIUS** Cuvier.1554. **Brosmius brosme** Müller. N. G. En. (1237)530.—**MELANOGRAMMUS**<sup>3</sup> Gill.1555. **Melanogrammus æglefinus** Linnaeus. N. G. Eu. (1238)531.—**GADUS** Linnaeus. (443)1556. **Gadus callarias** Linnaeus. N. G. A. Eu. (1239)1557. **Gadus ogac**<sup>4</sup> Richardson. G.532.—**PLEUROGADUS**<sup>5</sup> Bean.1558. **Pleurogadus navaga** Kölreuter. A. (1240)533.—**MICROGADUS** Gill.1559. **Microgadus proximus** Girard. C. (1241)1560. **Microgadus tomcod** Walbaum. N. (1242)534.—**POLLACHIUS** Nilsson.§ *Pollachius*.1561. **Pollachius virens** Linnaeus. N. Eu. (1243)1562. **Pollachius chalcogrammus** Pallas. A. (1244)§ *Boreogadus* Günther.1563. **Pollachius saida** Lepechin. G. A. Eu. (1245)

<sup>1</sup> *Physiculus dalwigkii* was included in the Synopsis on the basis of an erroneous identification. It should be omitted. A species of *Physiculus* has, however, been recently found. *Physiculus fulvus* Bean, Proc. U. S. Nat. Mus., 1884, 240. Gulf Stream, latitude 40° in 76 fathoms.

<sup>2</sup> *LOTELLA* Kaup.

(Kaup, Wiegmann's Archiv, 1858, 88; type *Lotella schlegeli* Kaup.)

This genus differs from *Physiculus* chiefly in the presence in both jaws of an outer row of large teeth. Deep sea. (Name, a diminutive of *Lota*.)

*Lotella maxillaris* Bean, Proc. U. S. Nat. Mus., 1884, 241. Gulf Stream, latitude 40°.

<sup>3</sup> It seems best to regard the different sections of *Gadus*, as given in the Synopsis, as distinct genera. *Melanogrammus*, especially, is well distinguished by the swollen form of the bones of the shoulder girdle.

<sup>4</sup> For description of *Gadus ogae*, which is regarded by Mr. Dresel as a valid species, see Dresel, Proc. U. S. Nat. Mus., 1884, 246.

(*Gadus ogac* Richardson, Fauna Bor.-Amer., III, 1836, 246. Greenland.)

<sup>5</sup> *Pleurogadus* Bean, nom. gen. nov. to be substituted for *Tilesia*, preoccupied. Type *Gadus navaga* Kölreuter = *Gadus gracilis* Tilesius. (Bean.)

535.—**HYPsicometes** Goode. B. (444)1564. **Hypsicometes gobioides** Goode. B. (1246)536.—**MERLUCIUS** Rafinesque. (445)1565. **Merlucius bilinearis** Mitchell. N. (1247)1566. **Merlucius merlucius** Linnaeus. G. Eu. (1248)1567. **Merlucius productus** Ayres. C. (1249)Family CXLVI.—**MACRURIDÆ.** (121)537.—**MACRURUS** Bloch. (447)1568. **Macrurus berglax**<sup>1</sup> Lacépède. G. Eu. B. (1251)1569. **Macrurus acrolepis**<sup>2</sup> Bean. A.1570. **Macrurus carminatus** Goode. B. (1252)1571. **Macrurus bairdii** Goode & Bean. B. (1253)1572. **Macrurus asper**<sup>3</sup> Goode & Bean. B.538.—**CORYPHÆNOIDES** Gunner (448)1573. **Coryphænoides rupestris** Gunner. G. B. (1254)1574. **Coryphænoides carapinus**<sup>4</sup> Goode & Bean. B.

<sup>1</sup> *Macrurus berglax* Lacépède = *Macrurus fabricii* Sundevall. To the synonymy add: (*Macrurus berglax* Lacépède, Hist. Nat. Poiss., based on *Macrurus rupestris* Bloch, not of Gunner; the synonymy confused with that of *Coryphænoides rupestris*, which is called "Berglax" ("Rock-Salmon") by Ström.

<sup>2</sup> *Macrurus acrolepis* Bean.

Form of *M. berglax*; width of head  $\frac{4}{5}$  its height; interorbital width  $\frac{4}{5}$  eye, which is equal to length of snout, and nearly 4 in head; snout moderate, pointed; maxillary a little more than  $\frac{1}{2}$  head; second ray of dorsal serrated; distance of anal from snout  $2\frac{1}{2}$  in body; pectoral nearly half head; ventral 8 in total length. Head, 44. Depth, 7. D. II, 11, III +. A. 94 +; 7 rows of scales between lateral line and front of dorsal. L. 2 $\frac{1}{2}$  feet. Straits of Juan de Fuca. A specimen obtained from the stomach of a seal by Mr. J. G. Swan. (Bean.)

(Bean, Proc. U. S. Nat. Mus., 1883, 362.)

<sup>3</sup> *Macrurus asper* Goode & Bean.

Dark reddish brown, the spinules with a metallic luster; stouter than in *M. bairdii*; scales small, strong, their free portions covered with vitreous spines in about 7 rows, the middle row not forming a keel, though projecting backward most strongly; interorbital with a little more than length of eye,  $4\frac{1}{2}$  in head; snout triangular, depressed; upper ridge prominent anteriorly, ending in advance of concavity of interorbital space; lateral ridges prominent, continued behind the eye; barbel shorter than eye; cleft of mouth reaching to below posterior margin of orbit; second spine of dorsal nearly two-thirds head, not reaching front of soft dorsal when depressed; anal three times as high as second dorsal; vent at a distance from ventral much greater than length of ventral. D. II, 8-105. A. 110. P. 20. V. 10. Scales 7-150-18. Gulf Stream, south of New England.

(Goode & Bean, Bull. Mus. Comp. Zool., Vol. X, No. 5, 1883, 196.)

<sup>4</sup> *Coryphænoides carapinus* Goode & Bean.

Scales oval, membranous, without armature, rather large, 22 to 24 in a transverse series. Second ray of dorsal compressed and serrate, as long as head; soft dorsal inserted on a lump-like elevation of the back. Vent nearly below end of first dorsal. Snout acute, projecting beyond the mouth a distance equal to diameter of eye, which is about 4 in head. Bones of head very soft and flexible; surface of head very irreg-

539.—**CHALINURA**<sup>1</sup> Goode & Bean.1575. *Chalinura simula* Goode & Bean. B.

## ORDER AA.—HETEROSOMATA. (U)

## Family CXLVII.—PLEURONECTIDÆ. (122)

540.—**BOTHUS** Rafinesque. (449)1576. *Bothus maculatus* Mitchell. N. (1255)541.—**PLATOPHRYS**<sup>2</sup> Swainson.1577. *Platophrys leopardinus*<sup>3</sup> Günther. P.1578. *Platophrys nebularis*<sup>4</sup> Jordan & Gilbert. S.

ular; a very prominent subocular ridge; a prominent ridge from tip of snout to middle of interorbital space; a curved ridge from front of eye above to a point on side of snout just behind its tip. Maxillary extending to opposite posterior margin of pupil, its length half head without snout. Interorbital space equal to length of upper jaw. Head 6. D. 11, 8-100. A. 117. V. 10. Gulf Stream, lat. 40°, in deep water. (Goode & Bean.)

(Goode & Bean, Bull. Mus. Comp. Zoöl., Vol. X, No. 5, 197, 1883.)

<sup>1</sup> *CHALINURA* Goode & Bean.

(Goode & Bean, Bull. Mus. Comp. Zoöl., Vol. X, No. 5, 1883, 198; type, *Chalinura simula*.)

Scales cycloid, fluted longitudinally, with slightly radiating striae. Snout long, broad, trunate, not much produced. Mouth lateral, subterminal, very large. Head without prominent ridges except the subocular ones and those upon the snout. Suborbital ridge not reaching angle of preopercle. Teeth in the upper jaw in a villiform band, those of the outer series much enlarged, those of the lower jaw uniserial, large. No teeth on vomer or palatines; small pseudobranchiae present. Gill-rakers spiny, strong, depressible, in double series on anterior arch. Gill membranes apparently free from the isthmus. Ventrals below the pectorals; chin with a barbel. Vertical fins as in *Coryphaenoides*. Deep-sea fishes. (Χαλινύρος, rein; ὄνρα, tail.)

*Chalinura simula* Goode & Bean.

Form of *Coryphaenoides*. Snout broad, obtuse, scarcely projecting beyond the mouth; its width at the tip nearly equal to its own length or to the interorbital width. Eye 5 in head, as long as snout; preopercle emarginate behind. Second spine of dorsal serrate; ventral prolonged in a filament which reaches 18th ray of anal. Head 5½; depth 6½. D. II, 9-113. A. 118. P. 20. V. 9. Gulf Stream, about latitude 40°. (Goode & Bean.)

(Goode & Bean, I. e., 1883, 199.)

<sup>2</sup> *PLATOPHRYS* Swainson.

(*Rhomboideichthys* Bleeker).

(Swainson, Nat. Hist. Class'n Fishes, etc., 1839, II, 302; type *Rombus ocellatus* Agassiz.)

Eyes and color on the left side. Body ovate, strongly compressed; mouth of the large type, but comparatively small; the maxillary one-third or less of the length of the head; teeth small, subequal, in one or two series; no teeth on vomer or palatines. Interorbital space broad and concave, usually broadest in adult males. Gill-rakers moderate. Dorsal fin beginning in front of eye; all its rays simple; ventral of colored side on ridge of abdomen; caudal convex behind; pectoral of left side usually with one or more filamentous rays, longest in the male. Scales very small (in American species); lateral line with a strong arch in front. Coloration usually variegated. Species numerous in warm seas. (Ιλακτύς, broad; ωφεύς, eyebrow.)

<sup>3</sup> *Rhomboideichthys leopardinus* Günther, IV, 31; *Parophrys leopardinus* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1884, 260. Guaymas.

<sup>4</sup> *Platophrys nebularis* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1884, 31. Key West, (Jordan); Long Island (Bean).

542.—**CITHARICHTHYS** Bleeker.§ *Aramaca*<sup>1</sup> Jordan & Goss.1579. **Citharichthys ocellatus** Poey. W. (1256 b.)1580. **Citharichthys pætulus** Goode & Bean. W. (1256)§ *Hemirhombus* Bleeker.1581. **Citharichthys ovalis**<sup>2</sup> Günther. P.§ *Citharichthys*.1582. **Citharichthys panamensis**<sup>3</sup> Steindachner. P.1583. **Citharichthys sordidus** Girard. C. (1257)1584. **Citharichthys stigmæus** Jordan & Gilbert. C. (1257 b.)1585. **Citharichthys spilopterus** Günther. S. W. P. (1258)1586. **Citharichthys macrops** Dresel. S.1587. **Citharichthys arctifrons** Goode. B. (1259)\*1588. **Citharichthys unicornis** Goode. B. (1260)1589. **Citharichthys microstomus**<sup>4</sup> Gill. N. (1261)543.—**ETROPUS** Jordan & Gilbert. (461)1590. **Etropus crossotus** Jordan & Gilbert. S. P. (1296)544.—**HIPPOGLOSSUS** Cuvier. (451)1591. **Hippoglossus hippoglossus** Linnaeus. N. G. A. Eu. (1261)545.—**REINHARDTIUS**<sup>5</sup> Gill. (452)1592. **Reinhardtius hippoglossoides** Walbaum. G. (1262)546.—**ATHERESTHES** Jordan & Gilbert. (453)1593. **Atheresthes stomias** Jordan & Gilbert. C. A. (1263)547.—**PARALICHTHYS** Girard. (454)1594. **Paralichthys adspersus**<sup>6</sup> Steindachner. P.1595. **Paralichthys californicus** Ayres. C. (1264)

<sup>1</sup> *Aramaca* Jordan & Goss, sub-genus nova, type *Hemirhombus petulus* Bean. This group includes species which have the broad, concave interorbital space, elongate pectorals, and other characters of *Platophrys*, but are without arch in the lateral line, as in *Hemirhombus* and *Citharichthys*.

<sup>2</sup> *Hemirhombus ovalis* Günther, Proc. Zool. Soc. London, 1864, 154; Günther, Fishes Centr. Amer., 1869, 472. Mazatlan to Panama.

<sup>3</sup> *Citharichthys panamensis* Steindachner, Ichth. Beiträge, III, 62, 1875. Mazatlan to Panama.

<sup>4</sup> *Citharichthys microstomus* Gill, Proc. Ac. Nat. Sci. Phila., 1864, 223. Atlantic coast. This species, lately rediscovered by Dr. Bean, is distinct from *C. spilopterus*, having a considerably smaller mouth. It approaches *E. crossotus*, but the latter species has the mouth still smaller and the body deeper.

<sup>5</sup> *Reinhardtius* Gill, has priority over *Platysomatischys*, but was proposed without definition or explanation.

<sup>6</sup> *Paralichthys adspersus* Steindachner, Ichth. Notizen, V. 1867–9. Mazatlan to Peru.

1596. *Paralichthys dentatus*<sup>1</sup> Linnaeus. N. S. (1265)  
 1597. *Paralichthys lethostigma*<sup>2</sup> Jordan & Gilbert. N. S. (1266)  
 1598. *Paralichthys alboguttata* Jordan & Gilbert. S. (1267)  
 1599. *Paralichthys squamilentus* Jordan & Gilbert. S. (1268)  
 1600. *Paralichthys oblongus* Mitchell. N. (1269)

548.—**ANCYLOPSETTA**<sup>3</sup> Gill.

1601. *Ancylopsetta quadrocellata* Gill. S. (1270)  
 1602. *Ancylopsetta dilecta*<sup>4</sup> Goode & Bean. B.

<sup>1</sup> *Paralichthys dentatus* (L.) *Common Spotted Flounder, Northern Flounder.*

Cape Cod to Florida, most abundant northward. The description in the synopsis (p. 822) of *P. ophryas*, belongs here. From *P. lethostigma*, it is especially distinguished by the more numerous (5 + 14) gill-rakers, and by the much more spotted coloration. The interorbital space is also narrower in specimens of the same size.

(*Pleuronectes dentatus* L., Syst., Nat., Ed. XII, 1766, 458, from a specimen from Dr. Garden; this specimen has been examined by Dr. Bean; it belongs to the present species; *Pleuronectes melanogaster* Mitchell, Trans. Lit. & Phil. Soc. N. Y., 1815, 1, 390; *Platessa ocellaris* DeKay, New York Fauna, Fishes. 1842, 300; *Paralichthys ophryas* Jor. & Gilb., Syn. Fish. N. A., 822; *Paralichthys ocellaris* Jor. & Gilb., l. e., 972, and Proc. U. S. Nat. Mus. 1882, 617; *Pseudorhombus ocellaris* Günther, IV, 430.)

<sup>2</sup> *Paralichthys lethostigma* Jordan and Gilbert.

Cape Cod to Florida and Texas, most abundant southward. Darker and more uniform in color than the true *dentatus*, the gill-rakers smaller and fewer (2 + 10) and the interorbital space broader.

(*Platessa oblonga* DeKay, New York, Fauna, Fish., 1842, 299, not *Pleuronectes oblongus* Mitchell; *Pseudorhombus dentatus* and *oblongus* Günther, IV, 425, 426; *Paralichthys dentatus* Jor. & Gilb., Synopsis 822, and Proc. U. S. Nat. Mus. 1882, 617; *Paralichthys lethostigma* Jordan & Gilbert, Proc. U. S. Nat. Mus. 1884, 237. The original type of *P. dentatus* examined by Dr. Bean in London proves to belong to the species having numerous gill-rakers.

<sup>3</sup> It seems more natural to regard *Ancylopsetta* and *Xystreurus* as genera distinct from *Paralichthys*. *Notosema* Goode & Bean (*dilecta*) seems scarcely different from *Ancylopsetta*.

<sup>4</sup> *Ancylopsetta dilecta* (Goode & Bean).

Dark brown, speckled with darker; three large, subcircular ocellated spots, nearly as large as eye, with white center, dark iris, narrow dark margin, and a brown encircling outline. These spots arranged in an isosceles triangle, the apex on the lateral line, the others distant from the lateral line a distance equal to their own diameter; the lower near tip of ventral. Fins blotched with darker brown. Right side white. Body elliptical, the caudal fin pedunculate; mouth moderate, the maxillary 2½ in head; teeth uniserial, those in front much largest. Eye large, 3 in head, the interorbital space very narrow. Gill-rakers subtriangular, moderately numerous. Pectoral fins unequal, the left 5½ in body. Ventral of colored side much produced, more than three times length of right ventral. First eight rays of dorsal exerted, forming a somewhat separate division, the second and third longest half greatest depth of body. Scales small, highly etenoid. Head 3½; depth 2. D. 69; A. 76; P. 11; V. 6; lat. 1.48 (in straight portion). Gulf Stream, off the Carolina coast. (Goode & Bean.)

(*Notosema dilecta* Goode & Bean, Bull. Mus. Comp. Zool., XIX, 193.)

The genus *Notosema* is distinguished from *Paralichthys* "on account of its elongated ventral fin, the triangular elongation of the anterior rays of the dorsal and the highly etenoid character of the scales on the colored side of the body." These characters are all, however, of degree only, and all exist in *Ancylopsetta quadrocellata*.

549.—**XYSTREURYS** Jordan & Gilbert.1603. **Xystreurus liolepis** Jordan & Gilbert. C. (1271)550.—**HIPPOGLOSSINA**<sup>1</sup> Steindachner. (455)1604. **Hippoglossina macrops** Steindachner. P.551.—**HIPPOGLOSSOIDES** Gottsche. (456)§ *Eopsetta*<sup>2</sup> Jordan & Goss.1605. **Hippoglossoides jordani** Lockington. C. (1274)§ *Hippoglossoides*.1606. **Hippoglossoides platessoides** Fabricius. N. G. En. (1272)1607. **Hippoglossoides elassodon** Jordan & Gilbert. C. A. (1273)§ *Lyopsetta*<sup>3</sup> Jordan & Goss.1608. **Hippoglossoides exilis** Jordan & Gilbert. C. A. (1275)552.—**PSETTICHTHYS** Girard.1609. **Psettichthys melanostictus** Girard. C. (1276)553.—**PLEURONICHTHYS** Girard. (456)1610. **Pleuronichthys decurrens** Jordan & Gilbert. C. (1277)1611. **Pleuronichthys verticalis** Jordan & Gilbert. C. (1278)1612. **Pleuronichthys cœnoscus** Girard. C. A. (1279)554.—**HYP SOPSETTA** Gill. (457)1613. **Hypsopsetta guttulata** Girard. C. (1280)555.—**PAROPHRYS** Girard.1614. **Parophrys vetulus** Girard. C. A. (1281)556.—**ISOPSETTA** Lockington.§ *Isopsetta*.1615. **Isopsetta isolepis** Lockington. C. (1282)<sup>1</sup> **HIPPOGLOSSINA** Steindachner.

(Steindachner, Ichth. V, 13, 1876; type *Hippoglossina macrops* Steindachner.) This genus is very close to *Paralichthys*, differing chiefly in the dentition, the teeth being small and uniform in size, arranged in a single row. The scales are ctenoid. The eyes are unusually large in the single known species, which bears a remarkable resemblance to *Hippoglossoides jordani*. The lateral line is however anteriorly arched in *Hippoglossina*, but straight in the latter species. (Name a diminutive of *Hippoglossus*.)

*Hippoglossina macrops* Steindachner, l. e. Mazatlan, probably from rather deep water.

<sup>2</sup> *Eopsetta* Jordan & Goss, subgenus nova, for *Hippoglossoides jordani* Lockington (λῆψις, excellent; ψῆπτα, flounder), characterized by the biserial upper teeth and by other peculiarities.

<sup>3</sup> *Lyopsetta* Jordan & Goss, subgenus nova, for *Hippoglossoides exilis* Jordan & Gilbert (λύω, to loosen; ψῆπτα, flounder), characterized by the large, loose scales, biserial upper teeth, and feeble structure.

§ *Inopsetta*<sup>1</sup> Jordan & Goss.

1616. *Isopsetta ischyra* Jordan & Gilbert. A. (1283)

557.—**LEPIDOPSETTA** Gill.

1617. *Lepidopsetta bilineata* Ayres. C. A. (1284)

558.—**LIMANDA** Gottsche.

1618. *Limanda ferruginea* Storer. N. (1285)

1619. *Limanda aspera* Pallas. A. (1286)

1620. *Limanda beani* Goode. B. (1287)

559.—**PLEURONECTES**<sup>2</sup> Linnaeus. (458)

§ *Platichthys* Girard.

1621. *Pleuronectes stellatus* Pallas. A. C. (1288)

§ *Pleuronectes*.

1622. *Pleuronectes quadrituberculatus* Pallas. A. (1289)

1623. *Pleuronectes glaber* Storer. N. (1290)

1624. *Pleuronectes glacialis* Pallas. A. (1291)

§ *Pseudopleuronectes* Bleeker.

1625. *Pleuronectes americanus* Walbaum. N. (1292)

560.—**GLYPTOCEPHALUS** Gottsche. (459)

1626. *Glyptocephalus cynoglossus* Linnaeus. N. Eu. B. (1293)

1627. *Glyptocephalus zachirus* Lockington. C. (1294)

561.—**CYNICOGLOSSUS** Bonaparte. (460)

1628. *Cynicoglossus pacificus* Lockington. C. A. (1295)

562.—**DELOTHYRIS**<sup>3</sup> Goode. (462)

1629. *Delothyris pellucidus* Goode. B. (1296)

563.—**MONOLENE** Goode. (463)

1630. *Monolene sessilicauda* Goode. B. (1298)

<sup>1</sup> *Inopsetta* Jordan & Goss, subgenus nova, type *Parophrys ischyros* Jordan & Gilbert. (Ἰση, sinew; θύρα, flounder.) This fish is allied to *Pleuronectes stellatus*, but has an accessory dorsal branch to the lateral line as in *Isopsetta isolepis*, from which it differs in form, and in the rough, loosely imbricated scales.

<sup>2</sup> The genus *Pleuronectes*, as retained in the Synopsis, is unnatural, species very diverse in their characters being retained in it. I have, therefore, here recognized its chief constituents as distinct genera. *Parophrys*, *Isopsetta*, *Lepidopsetta*, and *Limanda* seem certainly worthy of such recognition. Possibly *Platichthys*, *Inopsetta* and *Pseudopleuronectes*, also, are worthy of such retention.

<sup>3</sup> *DELOTHYRIS* Goode.

(Goode, Proc. U. S. Nat. Mus. 1883, 110; type *Thyris pellucidus* Goode; name a substitute for *Thyris*, preoccupied; δῆλος, clear; θύρις, window.) We have no doubt that this is a larval form, possibly of some fish as yet unknown, allied to *Citharichthys*. Small transparent flounders having all the characters of *Delothyris*, but less elongate than *D. pellucidus*, have been taken by the writer at Key West. These are thought to be larvae of some *Platophrys* or *Citharichthys*.

## Family CXLVIII.—SOLEIDÆ. (123)

564.—**ACHIRUS** Lacépède. (464)§ *Bavostoma*<sup>1</sup> Bean.**1631.** *Achirus brachialis* Bean. S. (1299 c.)**1632.** *Achirus comifer*<sup>2</sup> Jordan & Gilbert. W.**1633.** *Achirus mazatlanus*<sup>3</sup> Steindachner. P.**1634.** *Achirus inscriptus*<sup>4</sup> Gosse. W.§ *Achirus.***1635.** *Achirus achirus*<sup>5</sup> Linnaeus. W. S. (1299 b.)**1635b.** *Achirus achirus mollis* Mitchell. N. (1299)565.—**APHORISTIA** Kaup. (465)**1636.** *Aphoristia atricauda* Jordan & Gilbert. C. (1300)**1637.** *Aphoristia plagiusa* Linnaeus. S. (1301)**1638.** *Aphoristia nebulosa*<sup>6</sup> Goode & Bean. B.

<sup>1</sup> *Bavostoma* should probably be regarded as a subgenus of *Achirus* rather than as a distinct genus. Among the numerous species, the pectoral of the right side is found in every degree of development. In some species, a small pectoral is found on the left side in some specimens, while it is wanting in others. Still other species have also two pectorals developed.

<sup>2</sup> *Achirus comifer* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1884, 31. Key West.

<sup>3</sup> *Solea mazatlanus* Steindachner, Ichth. Notizen, IX, 1869, 23 (July) = *Solea (Monochir) pilosa* Peters, Berliner Monatsber., 1869, 709 (August). Mazatlan, southward.

<sup>4</sup> *Achirus inscriptus* Gosse.

Olivaceous, covered with an irregular network of blackish lines; this network rather finer on the head; some specimens crossed by irregular but nearly straight vertical lines; others without traces of these; dorsal and anal colored like the body, rather darker, with a paler edge; caudal abruptly whitish, immaeulate; blind side immaeulate, darker on the fins; hair-like appendages whitish; scales about head enlarged and fringed, especially on blind side; lip of eyed side much fringed: interorbital width less than eye; upper eye slightly in advance of lower; right pectoral of three rays, the middle one somewhat longer than the others; left ventral of one or two very small rays often entirely absent; right side with scattered cilia, which are mostly whitish; ventrals 5-rayed, the right ventral joined to the anal; head,  $3\frac{1}{2}$ ; depth,  $1\frac{1}{2}$ ; D., 54; A., 40; lat. l., 75 to 80. West Indies, north to Key West.

(*Achirus inscriptus* Gosse, Naturalist's Sojourn Jamaica, 52; *Solea inscripta* Günther, IV, 473; *Monochir reticulatus* Poey, Memorias Cuba, II, 1861, 317; *Solea reticulata* Günther, IV, 472; *Achirus inscriptus* Jordan, Proc. U. S. Nat. Mus., 1884, 143.)

<sup>5</sup> The name *Pleuronectes achirus* L. (*Achirus fasciatus* Lac.) was based on specimens from Surinam; the name *Pleuronectes lineatus* on the figures of Brown and Sloane of fishes from Jamaica. If, therefore, the West Indian form is considered distinct from the northern one, the former must be *Achirus achirus* or *Achirus lineatus*, and the latter must take Mitchell's name, "mollis." If considered as varieties of one species, the West Indian form has the prior names.

<sup>6</sup> *Aphoristia nebulosa* Goode & Bean.

Grayish, everywhere mottled with brown; median keel on each scale dark and prominent. Body comparatively slender; scales small, rough; jaws and snout naked; interorbital space with one row of scales. Teeth small, apparently equally developed on both sides. Ventral well separated from anal, its longest ray 3 in head. Head  $5\frac{1}{2}$ ; depth  $4\frac{2}{3}$ ; D. 119, A. 107, P. O. V. 5. Scales 120-50. L.  $3\frac{1}{2}$  inches. Gulf Stream, off the coast of Carolina. (Goode & Bean.)

(Goode & Bean, Bull. Mus. Comp. Zoöl., XIX, 1883, 192).

## ORDER BB.—PEDICULATI. (V.)

## Family CXLIX.—LOPHIIDÆ. (124)

566.—**LOPHIUS** Linnæus. (466)1639. **Lophius piscatorius** Linnæus. N. En. (1302)

## Family CL.—ANTENNARIIDÆ. (125a)

567.—**PTEROHRYNOIDES** Gill. (466b.)1640. **Pterophrynooides histrio** Linnæus. S. O. (1303)568.—**ANTENNARIUS** Lacépède. (467)1641. **Antennarius annulatus** Gill. W. (1304)1642. **Antennarius ocellatus**<sup>1</sup> Bloch & Schneider. W. (1305)1643. **Antennarius sanguineus**<sup>2</sup> Gill. P.1644. **Antennarius strigatus** Gill.<sup>3</sup> P.569.—**CHAUNAX** Lowe. (468)1645. **Chaunax pictus** Lowe. B. (1306)

## Family CLI.—CERATIIDÆ. (125 b.)

570.—**CERATIAS** Kröyer. (469)1646. **Ceratias holboelli** Kröyer. B. G. (1307)571.—**MANCALIAS**<sup>4</sup> Gill. (470)1647. **Mancalias uranoscopus** Murray. B. (1308)

<sup>1</sup> *Lophius respertilio* Var. *ocellatus* Bloch & Schneider, Syst. Ichth., 1801, 142, based on the Pescador of Parra = *Antennarius ocellatus* Poey, Syn. Pisc. Cub., 1868, 105 = *Antennarius plenrophthalmus* Gill.

<sup>2</sup> *Antennarius sanguineus* Gill, Proc. Ac. Nat. Sci. Phila., 1863, 91 = *Antennarius leopardinus* Günther, Proc. Zoöl. Soc., London, 1864, 151. Cape San Lucas to Panama.

<sup>3</sup> *Antennarius strigatus* Gill, l. c. 92 = *Antennarius tenifilis* Günther, Fish Centr Amer. 1869, 440 = *Antennarius strigatus* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1882, 630. Cape San Lucas to Panama.

<sup>4</sup> The following notes on fishes similar to *Mancalias* were published in Forest and Stream of Nov. 8, 1883, by Dr. Theodore Gill:

" *Typhlopsaras*.—Ceratiines with an elongated trunk, rectilinear back, obsolete or no eyes, far exserted basal joint of the anterior spine and shortened terminal joint, a small intermediate and a pair of pedunculated dorsal appendages some distance in advance of the dorsal fin, and reduced pectoral fin with about 5 or 6 rays.

" *Typhlopsaras shufeldti*.—The first joint of the rod-like spine reaches to the axil of the dorsal fin, and the bulb to the base of the caudal fin, when the spine is bent backward; the bulb is pear-shaped and without any appendages; the dorsal has 4 rays, the anal 1, the caudal 8 (the median, 4 of which are forked), and there are 4 or 5 pectoral rays. A single specimen was found. I have dedicated the species to my esteemed friend, Dr. R. W. Shufeldt, U. S. A., the well-known ornithotomist.

" The name *Typhlopsaras* is a compound from the Greek *tuphos* (blind) and *psaras* (angler), meaning 'blind angler.'

" *Cryptopsaras*.—Ceratiines with shortened trunk, longitudinally convex back, small but conspicuous eyes, concealed basal joint of the anterior spine and elongated ter-

572.—**ONEIRODES** Lütken. (471)1648. **Oneirodes eschrichti** Lütken. B. G. (1309)573.—**HIMANTOLOPHUS** Reinhardt. (472)1649. **Himantolophus grœnlandicus** Reinhardt. B. G. (1310)1650. **Himantolophus reinhardti** Lütken. B. G. (1311)Family CLII.—**MALTHIDÆ**. (126)574.—**MALTHE** Cuvier. (473)1651. **Malthe vespertilio** Linnaeus. S. W. (1312)1651b. *Malthe vespertilio radiata*<sup>1</sup> Mitchell. S. (1313)1652. **Malthe elater**<sup>2</sup> Jordan & Gilbert, P.575.—**HALIEUTICHTHYS** Poey. (474)1653. **Halieutichthys aculeatus** Mitchell. W. (1314)576.—**HALIEUTÆA** Cuvier & Valenciennes. (475)1654. **Halieutæa senticosa** Goode. B. (1315)Order CC.—**PLECTOGNATHI.** (W.)Family CLIH.—**OSTRACIIDÆ**. (476)577.—**OSTRACION** Linnaeus. (476)§ *Lactophrys*. Swainson.1655. **Ostracion triquetrum** Linnaeus. W. (1316 b.)1656. **Ostracion trigonum** Linnaeus. W. (1316)1657. **Ostracion tricorne**<sup>3</sup> Linnaeus. W. S. (1317)

minal joint, a large intermediate globular and a pair of sub-pedunculated lateral dorsal appendages near the front of the dorsal fin, and well-developed pectorals of about 15 rays.

“*Cryptopsaras couesii*.—The basal joint of the rod-like spine is almost entirely concealed and procumbent, and the distal joint alone free, reaching backward to the dorsal tubercles; the bulb is pyriform and surmounted by a long whitish filament; the dorsal and anal have each 4 spines, the caudal 8 (the 4 middle dichotomous), and the pectorals each about 15 rays. The species has been named after the eminent ornithologist, Dr. Elliott Coues. The name is derived from the Greek *cryptos* (concealed,) and *psaras* (fisherman), and has reference to the concealed ‘rod’ or basal joint of the anterior spine or fishing apparatus.”

<sup>1</sup> *Malthe cubifrons* Rich., seems to be only an extreme variety of *Malthe vespertilio*. Every gradation in size and form of the rostral process exists between the very long-nosed var. *longirostris*, to the button-nosed *cubifrons*, and thus far I am unable to show any dividing lines. The original record of *Malthe cubifrons* as from Labrador was an error. It is not certainly known from any point north of Florida. The name *Lophias radiatus* Mitchell, Amer. Monthly Mag., March, 1818, 326, is prior to that of *cubifrons*. The short-snouted form may therefore stand as—

*Malthe vespertilio radiata*. (See Jordan & Swain, Proc. U. S. Nat. Mus., 1884, 234.)

<sup>2</sup> *Malthe elater* Jordan & Gilbert, Proc. U. S. Nat. Mus., 1881, 365. Mazatlan.

<sup>3</sup> *Ostracion tricornis* Linnaeus. Syst. Nat., X, 1758, 331 = *Ostracion quadricornis* Linnaeus, (lower down on the same page.)

## Family CLIV.—BALISTIDÆ.

578.—**BALISTES** Linnaeus. (477)

1658. *Balistes vetula* Linnaeus. W. (1318)  
 1659. *Balistes carolinensis*<sup>1</sup> Gmelin. S. W. Eu. (1319)  
 1660. *Balistes powelli* Cope. Acc. (1320)  
 1661. *Balistes polylepis*<sup>2</sup> Steindachner. P.  
 1662. *Balistes capistratus*<sup>3</sup> Shaw. P.

579.—**MONACANTHUS** Cuvier. (478)§ *Monacanthus*.

1663. *Monacanthus ciliatus*<sup>4</sup> Mitchell. W. (1321, 1323)  
 1664. *Monacanthus hispidus* Linnaeus. S. N. (1322)  
 1665. *Monacanthus spilonotus* Cope. W. (1324)

§ *Cantherhines* Swainson.

1666. *Monacanthus pullus* Ranzani. W. (1325)

580.—**ALUTERA** Cuvier. (479)

1667. *Alutera schœpfi* Walbaum. N. S. (1326)  
 1668. *Alutera scripta* Osbeck. W. (1327)

## Family CLV.—TETRODONTIDÆ.

581.—**LAGOCEPHALUS** Swainson. (480)

1669. *Lagocephalus laevigatus* Linnaeus. W. S. (1328)

582.—**TETRODON**<sup>5</sup> Linnaeus. (481)

1670. *Tetrodon politus* Girard. C. P. (1329)  
 1671. *Tetrodon testudineus* Linnaeus. W. (1330.)

<sup>1</sup> *Balistes carolinensis* Gmelin, Syst. Nat., 1788, 1468 (as variety of *B. vetula*). *Balistes capiscus* Gmelin occurs first on page 1471, and is based on a confusion of several species. *Balistes powelli* is possibly the young of this species.

<sup>2</sup> *Balistes polylepis* Steindachner, Ichth. Beitr., V, 21, 1876. Mazatlan to Panama.

<sup>3</sup> *Balistes capistratus* Shaw, Gen. Zoöl., V, 417, 1804 (based on *Baliste bridé* Lacépède) = *Balistes mitis* Bennett = *Balistes frenatus* Richardson. Mazatlan to Panama.

<sup>4</sup> *Balisites ciliatus* Mitchell, Amer. Monthly Mag., 1818, 326 = *Monacanthus occidentalis* Giinther = *Monacanthus daridsoni* Cope. See Jordan, Proc. U. S. Nat. Mus., 1884, 145.

<sup>5</sup> The earliest attempt at subdivision of the genus *Tetrodon* as left by Cuvier seems to be that of Swainson. In his restricted genus *Tetrodon* no Linnaean species are retained, his "*Tetrodon testudineus*" being that of Bloch, not of Linnaeus. The next attempt is that of Müller, who did not retain the name *Tetrodon* for any of his subdivisions. The next attempt at subdivision seems to be that of Bleeker, who retained the name *Tetrodon*, in accordance with his custom, for the first species mentioned by Linnaeus, *T. testudineus*. This seems to me the earliest use of the restricted name *Tetrodon* which can stand.

In a recent paper, Dr. Gill (Proc. U. S. Nat. Mus., 1884, 420) has adopted a different view. The *Tetrodon* of Swainson contains three species congeneric with one of the Linnaean species (*lineatus*). This species belongs to Müller's genus *Arothron*, and to *Arothron* Dr. Gill transfers the name *Tetrodon*, reserving for the *Tetrodon* of Bleeker and of our Synopsis the name *Cirrhisomus* of Swainson.

- 1671b. *Tetrodon testudineus annulatus*<sup>1</sup> Jenyns. P.  
 1672. *Tetrodon spengleri* Bloch. W. (1331)  
 1673. *Tetrodon nephelus*<sup>2</sup> Goode & Bean. S. W. (1332 b.)  
 1674. *Tetrodon turgidus* Mitchell. N. (1332)  
 1675. *Tetrodon trichocephalus* Cope. Acc. (1333).

583.—**PSILONOTUS**<sup>3</sup> Swainson.

1676. **Psilonotus punctatissimus** Günther. P.

## Family CLVI.—DIODONTIDÆ.

584.—**TRICHODIODON** Bleeker. (482)

1677. **Trichodiodon pilosus** Mitchell. O. (1334)

585.—**DIODON** Linnaeus. (483)

1678. **Diodon hystriculus** Linnaeus. W. P. (1335)  
 1679. **Diodon liturosus** Shaw. W. P. (1136)

586.—**CHILOMYCTERUS** (Bibron) Kaup. (484)

1680. **Chilomycterus geometricus** Mitchell. N. S. (1337)  
 1681. **Chilomycterus fuliginosus** DeKay. N. (1337 b.)  
 1682. **Chilomycterus reticulatus** Linnaeus. W. (1337 c.)

## Family CLVII.—ORTHAGORISCIDÆ. (130)

587.—**MOLA**<sup>4</sup> Cuvier. (485, 486)

1683. **Mola mola** Linnaeus. N. S. W. O. C. Eu. P. (1338, 1339)

<sup>1</sup> *Tetrodon annulatus* Jenyns, Zoöl. Beagle, 1842, 153 = *Tetrodon heraldi* Günther, VIII, 283. Gulf of California to Peru. This species is little, if at all, different from *T. testudineus*.

<sup>2</sup> *Tetrodon nephelus* is extremely variable in regard to its spinous armature. Specimens from Key West show all gradations from entire smoothness above and below to the condition described in the text (page 966). Older specimens are generally less prickly than young ones.

<sup>3</sup> *PSILONOTUS* Swainson.

(*Anosmius* Peters; *Tropidichthys* and *Canthogaster* Bleeker; *Anchisomus* Richardson.) (Swainson, Nat. Hist. Classn. Anim., II, 1839, 328; type *Tetrodon rostratus* Bloch.)

This genus differs externally from *Tetrodon* in having the nostrils obsolete, and the back compressed to a keel. The skeleton differs so widely from that of *Tetrodon* that Dr. Gill (Proc. U. S. Nat. Mus., 1884, 422) has proposed to regard it as forming a distinct family, *Psilonotidae*. Species rather numerous in the tropics. ( $\Psi\acute{\imath}\lambda\sigma$ , bare;  $\nu\acute{\omega}\tau\sigma$ , back.)

*Psilonotus punctatissimus* Günther. *Tetrodon punctatissimus* Günther, VIII, 302 = *Tetrodon oxyrhynchus* Lockington, Proc. Ac. Nat. Sci. Phila., 1881, 116. Gulf of California to Panama.

<sup>4</sup> The generic name *Mola* first appears in Cuvier, Tableau Élementaire, 1798, p. 423, thus having three years priority over *Orthagoriscus* (1801).

The recent researches of Mr. John A. Ryder render it very probable that the small fishes known as *Molacanthus* are, after all, young forms of *Mola*. I therefore omit *Molacanthus nummularis*.

*Ranzania truncata* (No. 1139 b) should not be included in the present list, as it has not been taken nearer our coast than the Bermuda Islands.

## RECAPITULATION.

The following is an approximate statement of the number of species and subspecies, now known, belonging to each of the principal faunal areas. No species is counted twice, but in case of the numerous species which range over several faunal areas each is referred to that area which is supposed to be most properly its home, or to that in which its occurrence has been longest known. In regard to many species such an assignment is simply arbitrary, and in this fact lies the chief element of error in the following list. Thus many Arctic shore fishes belong to the Bassalian fauna of New England, while many West Indian species occur northward more or less frequently as far as Cape Cod. No faunal region on our coast is bounded by sharp lines:

	Species.
Bassalian or deep-sea fauna of the Atlantic .....	105
Arctic (Greenland) fauna.....	65
New England (Newfoundland to Cape Hatteras) .....	95
South Atlantic and Gulf coast (shore fauna).....	140
West Indian fauna (including Florida Keys and "Snapper Banks" of Pensa- cola) .....	290
Tropical fauna of the Pacific (Gulf of California, southward).....	240
Californian fauna (Cape Flattery to Cerros Island).....	220
Alaska (Cape Flattery to Bering's Straits).....	90
Pelagic species .....	35
Fresh waters: East of Rocky Mountains.....	465
Fresh waters: Between Rocky Mountains and Sierra Nevada (Great Basin, &c.) .....	75
Fresh waters: West of Sierra Nevada and Cascade Range.....	50
Total .....	1,870

INDIANA UNIVERSITY,  
January 1, 1885.

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## ERRATA.

Species No. 8 should stand as *Petromyzon concolor*, Kirtland, instead of *P. bdeum*. *Ammocætes concolor* seems to be the larva of this species.

Species 11 b. The subspecies should stand as *Petromyzon marinus unicolor* DeKay, instead of *P. m. dorsatus*. *Ammocætes unicolor* DeKay is the larva of this form.

Genus 39. The name *Dasybatis* (Klein) Rafinesque, is prior to *Trygon* Adanson (1817), and must be used for this genus (cf. Garman, Proc., U. S. Nat. Mus., 1885).

Genus 61. *Hypentelium* should be reunited to *Catostomus*.

Species 328. Should stand as *Hybopsis kentuckiensis* Rafinesque, instead of *H. biguttatus*. It seems to be the *Luxilus kentuckiensis* Raf.

Species 601. Should apparently stand as *Esox masquinongy* Mitchell instead of *E. nobilior*.

The name of Family LXVIII a.—*Scomberesocidae* was inadvertently omitted before genus 195, *Scomberesox*.

Species 1637 should apparently stand as *Aporistia fasciata* Holbrook, instead of *A. plagiata*.





























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